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# *Astounding* **SCIENCE FICTION**

THOU GOOD AND FAITHFUL BY JOHN LOXMITH



The Shadow character is depicted in a full-length, black silhouette. He wears a wide-brimmed hat and a long, flowing cape that covers his entire body. His face is partially visible through a white mask or opening in the cape. The figure stands with a slight lean, looking towards the right.

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MARCH 1953

VOL. LI, NO. 1

## NOVELETTES

- THOU GOOD AND FAITHFUL . . . by *John Loxmith* 8  
BUTTON, BUTTON . . . by *Thomas Wilson* 48

## SHORT STORY

- FOOL'S MATE . . . by *Robert Sheckley* 99

## ARTICLE

- FIVE BILLION DOLLAR MAGPIE . . by *Wallace West* 82

## SERIAL

- NULL-ABC . . . by *H. Beam Piper and John J. McGuire* 112  
(Conclusion)

## READER'S DEPARTMENTS

- THE EDITOR'S PAGE . . . 6  
THE ANALYTICAL LABORATORY . . . 47  
IN TIMES TO COME . . . 111  
THE REFERENCE LIBRARY . . by *P. Schuyler Miller* 154  
BRASS TACKS . . . 162

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## UNSANE BEHAVIOR

I have, in the past few weeks, turned down a large number of yarns based on the variations of the Atomic Doom thesis. It may save time for both would-be writers and for myself to discuss the matter of Atomic Doom. I made the mistake about five years ago, and learned from the readers that it was a mistake; I can thank you for the lesson, and pass it on to would-be writers now.

Men have had wars for not less than seven thousand years. How much longer is a matter of guesswork, but records definitely show that the business has been going on that long.

I hold that the reason all animal life forms are equipped with a sense of discouragement is so that they can learn, after an adequate number of tries, that Course Of Action A simply does not work. It occurs to me that seven thousand years of trying should con-

stitute an adequate indication that there's something wrong with Course Of Action W, also. Let's analyze for a moment, and see what Course Of Action W actually is, and even if our Society doesn't discourage very easily — most extremely stupid life forms are very hard to discourage, also — perhaps we, as individuals, can learn from it.

Essentially, war is an effort to force compliance with fear as the force applied. It's the effort to scare someone into doing what we want them to do, instead of what they want to do. Does it work?

It does not. Categorically, I will defend the proposition that it does not, has not, and never will work — save on the shortest term of immediacy. Let's consider the proposition in the case of the individual.

The penalty for murder is, in most

places, execution. That is, the would-be murderer is restrained, says society, by fear of death. Murder we have with us after all the years of recorded history.

The penalty for horse-stealing has, for ages, been execution or imprisonment. Horse-stealing lasted through all recorded history, stopping only recently. What stopped it?

Not threats, not more drastic punishment. It stopped when, and only when, the thieves stopped wanting to steal horses.

The only known punishment for thieving that has ever been successful in stopping the activities of petty thieves and pickpockets has, it happens, been abandoned. It was standard for many centuries, and it actually works; if you cut off both hands at the wrist, the thief becomes unable to pick pockets or do petty thieving.

In some distant time, perhaps, mankind may make a new association: fear does not, never has, and never will stop a human being. It's incredibly stupid of a society to fail to observe that simple fact after seven full millennia of records attesting to it. Fear serves only to deflect the action, to delay it, or to make it manifest itself in an ambush instead of an open attack.

An effort to enforce a behavior pattern by use of fear does produce hatred, and the enmity will show itself in some satisfyingly — to the hater — successful way sooner or later.

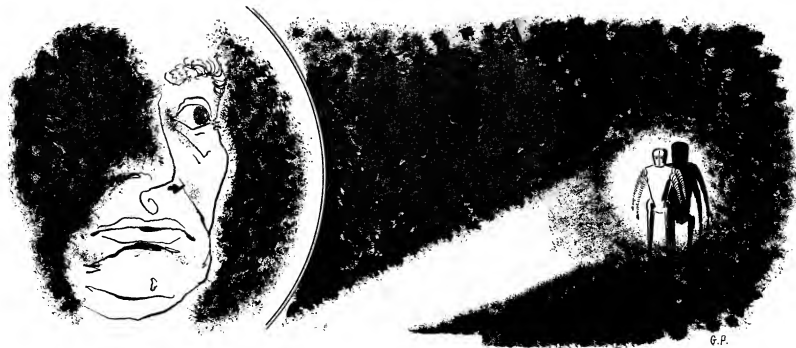
Anyone who thinks that the human being can be scared into behaving has definitely not learned the lesson of history; he can only be induced, by threats, to *pretend* compliance. If you teach a child that the reason he must not commit murder is that he will be punished, the obvious corollary is that there is no reason why he should not commit murder if he can get away with it. He will therefore use all his human ingenuity to figure ways to commit murder and get away with it. If punishment is the best reason you can think of for not committing murder, your culture is certainly poverty-stricken when it comes to ideas.

Now similarly, our thick-headed, muddle-minded moralists who, today, chant of the dangers of Atomic Doom as *the reason* for abjuring war are trying to scare human beings into behaving. Some centuries ago, hell-fire and damnation were the conventional threats. They didn't work either.

Thinking up more gruesome and horrible ways of presenting the awfulness of atomic war is quite futile. It's as futile as any other effort to scare human beings into a particular pattern of behavior.

And if that's the best reason a writer can think of for not going to war, our culture is certainly poverty-stricken when it comes to ideas — and maybe it needs to be wiped out to make way for one with some better ideas that do work.

THE EDITOR.



G.P.

# THOU GOOD AND FAITHFUL

BY JOHN LOXSMITH

Illustrated by Pawelka

The big ship eased leisurely out of hyperspace, solidified into reality, and settled with a few prim puffs from its steering jets into an orbit around the planet.

"There it is, captain," said Deeley with pardonable pride.

The captain nodded, pipe clenched between his teeth, and said, "I wonder what we'll find here."

In seventy years of wandering he had grown to expect the unexpected.

Around him in the big cabin that tradition insisted on calling the bridge the four senior officers under his command sat at their control desks, from which each co-ordinated the informa-

tion provided by his particular department. Officially, Deeley's title was Nav; Spinelli's, Engines; Engelhart, Personnel; Adhem, Biological, and Keston, Observation. In practice, these names were pretty elastic.

The planet filled nearly half of the direct viewport with blue-green radiance, dimmed in patches by the presence of two atmosphereless moons which lay like dark stones in a shallow shining pool. Beyond it hung the curtain of ten million stars—a mass of dusky gold, the very center of the galaxy.

It didn't yet seem right that there should be stars packed so thick in any

*When Man starts exploring other planets, he must expect to meet alien beings. Some, of course, will be friendly; some violently hostile; some utterly uninterested. And some may be far ahead of us in development. The explorers need caution!*

planet's sky.

The captain's name was Chang—a good terrestrial name—but he had been raised on New Earth, Alpha Centauri IV, way out towards the rim of the galaxy, where the stars were no more than occasional flecks of gold in the dark velvet of the sky. Here in the neighborhood of the Hub it was different. Here it was the black that pitted the bright.

The world below looked to be a good world, though it was maybe twice as old as Earth. This was an older part of the universe. There were a few brilliant clouds in its atmosphere, and there were wide seas, but



not so wide as Earth's, being less than half the surface of the planet. And chlorophyll green shone bright on the spectroscopes.

There were no deserts and no ice-packs.

Behind him, Keston of Observation cleared his throat and said, "Captain, here's the data on the planet."

"Let's have," said Chang.

"Density, mass and surface grav are so close to Earth normal we can't differentiate them. Air's a little thin—about thirteen point six pounds at sea level, I guess—and high on CO<sub>2</sub> and low on oxygen, but only about a per cent each way. Plenty of water vapor—in short, breathable. Forty-five per cent of the surface is ocean. Has a twenty-nine hour day and about an eleven month year. It's an older world than Earth, and the pull of the moons and the sun have respectively lengthened the day and shortened the year."

Chang nodded, said, "Is that all?"

"Just about. We haven't made out any evidence of habitation yet, but that'll come if it exists. There's a lot of vegetation—chlorophyll vegetation—both in and out of the sea."

Chang took his pipe out of his mouth and blew smoke. He said, "Good. Tell me if you get anything else, will you?"

"Right, sir."

He sucked on his pipe ruminatively, relaxing in his chair before the view-

port. A planet matching Earth this close was a find in a million, literally, for an oxygen-high atmosphere was the second most unstable of all possible atmospheres and rarely survived, whereas chlorine-high, hydrogen-high and methane-high were all too common. It could mean retirement and ease for them when the colonists came. They could ask their own price for an acre of ground.

Assuming it was uninhabited and theirs by right of prior discovery, that was, and he felt it might be. This close to the Hub, where the ships that had been so far might be numbered on your fingers, a previous discovery was unlikely, and as for indigenous races, oxygen reactions seemed to build unstable life forms which died quickly. A world twice as old as Earth might once have been inhabited—

But he was basing his judgments on data gathered far away. Too far away. Here, everything might very well be new.

From behind him, Keston said: "Sir, Sandiman thinks he's found signs of habitation on the inner moon."

"Indigenous or planted?" said Chang.

"Can't tell, sir, but I'd advise investigation."

"We'll take a look at it, then," said Chang with decision. "Engines!"

"Sir?" said a quiet voice with a lilting Romance accent. Spinelli had inherited that from an ancestor more

than half a millennium ago, back in the days before the races merged.

"Shift us over to the nearer moon," said Chang.

"Sir," said Spinelli.

The viewport changed. For an instant there was the golden glory of stars. Then the barren, airless, pitted face of the inner moon began to show clearly, lit by the reflected light of its primary, and at last hung steady, almost filling the viewport, while they played off its attraction against an antigrav beam. Chang looking it over, said, "Keston, have someone put a 'scope on this port, will you?"

The image blanked for a second before a small section of it reappeared, fantastically bloated, as if it were scant yards away instead of two hundred miles. Keston volunteered, "Sandiman reported something in the crater with its ringwall in three sections—see it?"

"I see," nodded Chang.

Deeley had got up from his chair and come over to stand behind him. Shortly, he uttered a muffled exclamation and said, "Sir, what's that hut?"

Chang permitted himself a slight smile. "It's rather more than a hut," he said. "From the way it shows up you could put this ship inside it and have room to spare. Looks to me like the top dome—supply lock, maybe—of a pressurized city."

Deeley said, with the disappointment in his voice partly masked by his interest in contacting a new culture,

"Then that means a non-indigenous race, doesn't it?"

"Looks like it," nodded Chang, leaning closer to the port. He said in a curious tone, "Keston, have the magnification stepped up, and tell me what's odd about that dome."

The picture again swelled enormously, and Keston said, with more than a hint of relief in his voice, "Locks are open, sir, inner and outer, and there are a number of meteor rents in the roof."

"I thought it looked odd. That means we needn't expect much trouble from that quarter. Is it the only one on the moon?"

After a pause, "Yes, sir," reported Keston. "And we haven't found any signs of habitation on the planet, either. Hardesty thinks he's found a city site, but it's so overgrown it equally well could be a natural formation. No sign of cities or even roads."

"Good," grunted Chang. "Spinelli, put us down within shouting distance of that dome, will you?"

"Right, sir," Spinelli answered.

His viewport blanked for a moment as they took the 'scope off it, and then relit to show the distant moon rising rapidly to meet them. At this range he could quite easily make out the dome with his naked eye.

Then the crater with the triply split wall filled the port, and the big ship settled with hardly a jolt on a level surface fused and scarred by the

hot jets of rockets landing and taking off. The image in the port stilled, and was that of the ringwall outlined against the stars.

A searchlight sprang up, began a methodical sweep across the floor of the crater, and they waited with interest for what it might show.

After a while, Keston said, "Sir, we've picked up a rocket in the shadow of the far ringwall. I have it on my screen."

Chang got up and came across the bridge to survey the harshly black and white image in front of Keston. The rocket was a small one, perhaps even an individual job, and its hull shone unblinkingly in the glare of the searchlight.

"Locks wide, you notice," commented Chang after a while. "Looks like it got left behind when they quit. Put the building on the screen, will you?"

The screen flickered and then went blank except for the jagged line of the ringwall silhouetted against the stars. It was a matter of two or three seconds before the searchlight swept around and showed a tall building, tall with the fantastic flying tallness of low gravity, that looked like the main hall at Grand Central Spaceport made aesthetically acceptable. You could have put the ship inside it with no trouble at all.

Chang studied it with considerable interest. It was plainly the work of a race versed in architecture, for it was

superbly designed to waste no more than necessary on resisting gravity, yet to maintain an atmosphere at fourteen pounds to the square inch without risk.

*But* it was open and deserted.

They stood looking at it in silence, except for the very quiet humming of the generators and the *creak-crack* of the hull that was the ship talking to itself. Finally Chang straightened with a grunt.

"Engelhart!"

"Sir?"

"Are your men standing to battle stations?"

"Of course, sir," said Engelhart with injured dignity.

"They needn't. There won't be a reception committee. But detail me a couple of men to come on over and take a gander at this place before we go downstairs, will you? You can come yourself if you like."

"Glad to, sir," said Engelhart. "What do I tell the men we've got?"

"Looks like a plum cake, but tell them not to count their chickens. Say we've struck an Earth-type world which looks like it's uninhabited, but emphasize that bit about the *looking*."

"Good enough, sir. When do we start?"

"As soon as you're ready," said Chang. He knocked out his pipe and went towards the door, paused before going out to look at the scene in the viewport. So many stars, and no

knowing what you'd find among them—

He went down to Medical and submitted to having his semicircular canals numbed to prevent nausea and his heart slowed to avoid wasting energy. Then two orderlies helped him into his bulky spacesuit, and he shuffled awkwardly out of the hospital section into the anteroom of the personnel lock.

There was only moon gravity here—about one-tenth *g*—and he flexed his arms and legs a few times and checked his equipment. Before he finished Engelhart joined him, face keen and sharp behind his transparent mask. He nodded, clicked on his microphone and said, "Can you hear me, sir?"

"Loud and clear. Who've you picked to come with us?"

"Trooper Anson, sir. He'll be here in a moment." He checked his oxygen supply with practiced efficiency, turned his torch on and off a few times, and stamped to make sure his joints were working freely.

Then Trooper Anson joined them, and they moved cautiously into the lock and waited while the big doors behind them slid shut. Before the others opened, a voice crackled in their phones.

"Keston here, sir. We're keeping our 'scopes on you just in case, but I don't expect you'll find trouble. We found one hole in the top of the building twenty feet across."

Chang said, "Right. Stand by to open locks. Ready?"

"Ready."

They turned on their magnetic soles for the brief instant in which the air in the lock *whooshed* out into free space with a thin scream, and then they moved forward to the top of the ramp beyond and stood staring at a monument to a vanished race.

The stars filled the sky so brightly that they had to shade their eyes to see it in the dim glow of the searchlight—a vast and empty, and enigmatic, building.

Chang' said slowly, "That's a lovely piece of design, Engelhart."

Engelhart nodded behind his faceplate. "They never knocked *that* up on their first trip. I'd lay good money on there being a city under here. I wonder why they abandoned it."

Chang shrugged. "We'll find out later—perhaps. Shall we move?"

They went down the metal ramp to the scorched rock at its foot, snapped off their magnetic soles and began to bound in twenty-foot leaps across the short mile that separated them from the building.

For a while there was no noise except star static and the irregular thud after each jump as they landed with enough force to disturb the microphones, and they braked gradually to a halt a few yards from the open end of the building.

They stood surveying it. After a

pause, Chang said, "Anson!"

"Sir?"

"Shine your torch inside, will you?"

A few seconds later a puddle of dazzling light a few inches in diameter sprang up on the ground before them and leaped into the cavernous hollow, widening as it did so. It showed nothing.

Chang said, "Switch it off," and took the shade away from his faceplate.

After a while he could make out a little of the interior by the starlight that filtered through a dozen gashes in the vaulting roof. The main floor of the hall was smooth and level, but stacked at the sides were crates, their metal bright and untarnished in the airlessness, and a small vehicle stood parked against one wall.

Far at the back he could dimly discern something like an elevator shaft leading down into the crust of the moon—presumably the city of which this was the outward and visible sign.

He said, "Keston, still watching us?"

"Of course, sir," Keston answered from the ship.

"We're going inside. Your 'scopes'll lose us and I imagine radar will, too. These walls are metal. I'll have Anson stay here, though, and we'll relay messages through him. Got that?"

"Right, sir," said Keston.

Anson had already taken his orders and moved off to one side. He was unfolding the chair attachment of his

suit as Chang and Englehart took their first cautious steps into the building, their torches shedding small circles of light that dimmed to nothing a hundred feet away.

The floor, Chang noted, was metal, smooth and unmarked save for a few bright scratches. He heard a thud then, both through his earphones and by bone-conduction from the floor. He turned in astonishment to see Engelhart making determined but fruitless efforts to lift his feet from the floor.

Engelhart cut short his startled exclamation. He said in a queer voice, "I just switched on my magnets to see if the floor was magnetic, sir. Take a look at it, will you?"

Chang nodded and bent down, examining it. It was cobalt blue and magnetic, and the durasteel knife built into his right glove blunted its tip against it. He looked up and said in an awed voice, "That's durasteel, Engelhart."

"Yes, sir. I thought so. And any race that can afford to throw it around like this has my respect."

Chang got up slowly. "Mine too, Engelhart," he said. "This place just couldn't be duplicated by man. Why, any single planet wouldn't have enough durasteel to floor it. They got a long way ahead of us, then. I wonder why they went."

Engelhart shrugged, and they went over to inspect the crates piled up at

the side, but they were empty, or contained no more than the flotsam left by a swiftly ebbing tide of civilization—so much so, that one would have sworn the users of the hammers and drill atop the open crates had just put them down and would be back in a moment. The small vehicle afforded no clues. It was apparently self-propelled, but there was no visible power source, unless it absorbed induced electricity from the floor, or broadcast energy; the controls, which might have helped them to picture the creature who used them, had been pared down to a single rod bearing a simple press-button on the tip that served for both steering and start-stop gear, and there was no rest or seat.

Chang grunted, said, "That tells us a lot!"

Engelhart said, "Sir, I think if there is anything to be found here at all, it'll be in the city beneath, and that may call for a full-scale investigation. Chances are it'd be simpler to study the planet itself. If they've had space travel and lost it, even if they haven't died off altogether, they won't present any serious problem."

"Agreed. But we'd best have a look at the entry to the city beneath at least before we move on." Chang swept his torch-beam around and froze suddenly, his free hand groping wildly for the blaster at his side. Englehart caught his muttered exclamation, followed his eye and almost cried out in horror.

Then Chang relaxed, chuckling. "Phew, that gave me a fright! I thought for a moment we'd run across an alien, but it's only a robot. I wonder how long it's been here."

Engelhart wiped his forehead a little shakily against the absorbent lining of his helmet, and said with heartfelt relief, "Let's go take a look at it, sir."

Together they leaped across the intervening forty-odd yards and halted to survey the immobile robot. It was not purely uniform, but like many human-built servitors a rough imitation of its creators. It was about nine feet tall and faintly anthropoid in that it had a head, topping a cylindrical body, but it had six limbs—two legs, four arms ending in delicate plierlike devices with cutting, shaping and gripping appliances. Two lenses in the front of its head, set close together, shone dully in the light of their torches.

"Will you want this taken back to the ship?" Engelhart asked.

"No, that can wait. It's been here space knows how long already. It won't run away, and another few days waiting won't hurt it. There are more urgent things to do."

With a lingering backward glance at the motionless machine, Engelhart turned to follow the captain into the back of the hall, towards the downward-leading shafts. They also had locks, as a precaution against meteor-damage to the outer section, but at

both ends they were fully open, and there was no air below.

Chang shuddered slightly as he looked down five hundred feet into their black depths. He said, "I wouldn't have liked to be down there when the first meteor hit."

Engelhart said, "I don't think there was anyone there then, sir. It looks to me as if they simply checked out in a big hurry—they wouldn't have left the outer locks open otherwise."

"That's a point," agreed Chang. "So there wouldn't be much below even if we did try to climb in. I think you were right about the advisability of moving downstairs right away. Let's go."

Engelhart was shining his torch down the shaft without result. He said, "I notice they did economize on the durasteel as far as lining the shaft goes. This floor's only about six inches thick, but even so it's a pretty costly extravagance—"

Chang turned sharply and stared back towards the entrance where Trooper Anson was visible waiting patiently in radio view of the ship.

"What is it, sir?" Engelhart demanded.

Chang gestured with his torch, and the other automatically followed an extension of his line of motion up to the jagged rents in the roof. He said, "See that big gash? How big a meteor do you imagine it would take to make it?"

Engelhart calculated rapidly. "I'd

say it couldn't have been less than twenty feet across, which means—eleven, twelve—a mass of maybe a hundred tons."

Chang began to move out across the floor, switching his torch from side to side as he went. He said, "Since when has six inches even of durasteel been able to take a kick like that? Can you see any signs of meteor fragments or splash damage? Ah, here we are. Look—the floor's been re-welded and ground smooth with a high velocity diamond buffer to make it level. And it's just below the biggest meteor strike."

Engelhart, glancing up at the thick-packed stars beyond the shattered roof, said, "That's very strange, sir."

Chang was following the marks of the weld around the floor. He said, half to himself, "Who repaired this floor? And why didn't they fix the roof first to give themselves air to work in?"

"Maybe they used robots for the job," suggested Engelhart. "That would account for the presence of the one we saw."

"Could do," said Chang, straightening up. "But then why didn't they finish the job? What made them stop halfway? And will it do the same to us? Out of here, Engelhart! Jump!"

Three quarters of an hour later he stood gazing from the viewport in the nose of the ship while they lifted away from the moon and began the leisurely

topple into an orbit that would brush atmosphere and allow them to settle without any fuss, letting the air do their braking for them.

Behind him Keston said suddenly, "Sir, Hardesty says he just picked up a flicker from astern. It's gone into radar shadow now, but he says it didn't look like a meteor—could have been a ship."

"Big or small?"

"Small, sir. About the size of the rocket we found back on the moon."

"Then it probably was that," said Chang, turning quickly. "Deeley, Spinelli, give us a quick put-down."

"Do you mean really quick or just quick, sir?" asked Spinelli. Deeley's hands leaped for the Nav computer before him.

"Really quick. A bottlestopper. Pick the largest piece of open—wide open—flat ground you can in the time. Engelhart!"

Engelhart said without looking round from his control desk, "Sir?"

"Get the men to battle stations again, just in case."

Engelhart nodded, pushed the red knob at the top left of his board. A bell sounded faintly somewhere in ship.

"Sir!"

"Yes, Spinelli?"

"Bottlestopper coming up, sir. We'll be down in about thirty seconds from—NOW!"

Twenty-nine seconds later the ship, red-hot from her whirlwind stoop through the atmosphere, fired half a

square mile of grasslike plants in the approximate middle of a smoothly rolling plain dotted with clumps of trees at intervals of about a mile. Engelhart, whose responsibility it was, ordered out the extinguisher sprays, and when the mist of their operation blew clear of the viewport Chang looked out on a blue sky a little darker than that of his own planet and a sun a little yellower than the one under which he had grown up. But the vegetation was green and waved in the breeze like grass, and faintly on the horizon showed low blue mountains. He said almost absently, "Deeley, this is a splendid world."

"Thank you, sir," said Deeley. He had deduced the existence of it from a distance of ninety light-years and brought them out of hyperspace within half a million miles of it—which was a remarkable piece of navigation—so there was reason for congratulation.

Engelhart said, "What are we supposed to do, sir?"

"Sit around, as usual, Engelhart—what else? We can't be sure it was a ship Hardesty picked up, but if it was and if it was the one we saw on the moon, then it can only be the robot on board."

They digested that in silence.

"In which case we can assume that the inhabitants will pay us a call, and soon. Maybe we were wrong in assuming that because the dome on the moon was broken they'd had space



travel and lost it. Maybe it's only temporarily out of commission while robots see to the damage, not completely abandoned."

Keston said dryly, "Then where are the inhabitants hiding, sir?"

Chang shrugged. He said, "This is an old world, Keston. The race inhabiting it could be a whole lot ahead of us. Maybe they don't build cities or roads. Maybe they live in isolated houses and fly everywhere. Keep your men to stations, Engelhart. Adhem!"

"Sir?" said the medical officer.

"While we're waiting, you can run off the usual tests—presence of viruses, bacteria, and injurious ingredients in the air and ground, and so on."

"Right away, sir."

They waited. It was unlikely that there were any natives within quite a few miles, at any rate. They had seen, as they came down, no roads, no cities, no spaceports, and no sign of any smaller artificial construction. True, they had had almost no time to look for them. They had come through one hundred ninety miles of detectable atmosphere in twenty-nine seconds, and even the so-called instantaneous cameras couldn't hold focus at that speed. But this nearly flat and mostly bare plain seemed natural and haphazard enough, without sign of planned layout, and if it was big enough for Spinelli to have picked it out from a hundred thousand miles out—

Adhem's speaker burped and whis-

pered for a moment, and after a few curt comments the medical officer said helplessly, "All right then." He turned to Chang.

"I can give *this* place a clean bill of health, sir," he said. His voice held a disapproving note.

Chang observed it, commented, "Something's eating you."

"Yes, sir. There is not one *single* bacterium, virus or subvirus in any of the air, soil or vegetation samples we took. There is no sign of any poison, either, but that doesn't worry us. But it isn't natural for there to be *no* bacteria!"

"Perhaps it isn't natural," said Chang equably. "After all, the only bacteria aboard this ship are the ones we use to digest our food, but that isn't natural. We saw to it ourselves."

"But you couldn't do that to a whole world—!"

"Why not? I'd believe a lot of a race that can afford to floor the supply lock of a complete city with durasteel. Either way, what does it matter? Engelhart!"

"Sir?"

"I want a thorough survey of the immediate neighborhood from as low as your boys can go without getting into trouble. Say within a radius of a hundred miles. That's your pigeon. Use helis, and screen them well. Deeley, I also want a full photographic record with wide-angle and instantaneous cameras and full color stereo prints of the entire surface of the



planet—land *and* water—from high level. You can have two of the lifeboats for that. And I want results quicker than jump. Engelhart—one more thing: Tell your boys to pay special attention to anything that could be a sign of habitation and report it as soon as found.”

“Right, sir,” said Engelhart, and he and Deeley turned to their control desks, whispering orders into hanging microphones.

Chang turned to Adhem, said, “Is this planet safe?”

“One hundred per cent, sir—and no reservations.”

“Right. Have the verandah extended, will you? Let’s go outside.”

They stood leaning over the rail of

the “captain’s verandah,” a platform extending outside the bridge halfway up the nose of the ship and thus about forty feet from the ground. Blue sky shone over them and the warmth of the sun refreshed them.

After a while Deeley and Engelhart joined them from inship, and they watched the survey helicopters purr out from their lock like a flight of gigantic bees, their vanes silver in the sunlight, and vanish from sight as their screens went up. Then with a roar and a clank the two lifeboats detailed for Deeley’s planetary mapping job kicked a couple of miles into the sky of antigrav beams from the ship and went heavenwards on a cloud of atomic flame. There was nothing to do but wait, warily.

Inside the ship the crew stood to battle stations. The launchers and the mine throwers and the energy beams and the fluorine spray jets swung evenly in their guides, invisible behind screens that would go down at the first sign of hostility. The radar antennae were out, poking their radiant fingers into the blue sky, and the electron 'scopes moved in continual survey of the neighborhood. There was small chance of them catching the approach of anything even moderately well screened, but there was the possibility that alien-built screens might fail to cover a band of radiation which men used. But the alarm on Keston's lapel speaker remained silent.

Engelhart picked a spot to lean over the rail, said appreciatively, "This could be Earth, couldn't it?"

Chang's pipe smoke rose blue and straight in the still air. He said with interest, "Have you been there, then?"

Engelhart laughed. He said, "Not I, sir. I was born on Beta Centauri III—Heimwelt, we call it. One of the few worlds to retain a second official language—Old German in our case, as well as Anglic Terrestrial. You been to Earth, sir?"

"No. In fact, I doubt if we have anyone aboard who has, let alone anyone born there. Have we, Deeley?"

Deeley grinned, said self-consciously, "Only myself, sir. I checked."

Chang said, "And I didn't know! Is this like Earth—really?"

Deeley turned and stared out across the greenness of the plain to the blue hills on the horizon. He said softly, "Not in the slightest. It's Earth as it may have been a thousand years ago, but there hasn't been room for this much peacefulness and beauty on Earth for a good many centuries. That's why I emigrated—to find a chance to be alone."

Chang nodded, his pipe tying a knotted trail of smoke. He said, "It's gotten that way on New Earth, too—where I was born. No place for beauty any more. Too much overcrowding. Too much to do and too little time to do it."

"Uh uh," agreed Keston with a touch of cynicism. "But by the same token, if this world is uninhabited our fortunes'll be made by the spill-over from those same overcrowded planets."

"What a mess that'll make," said Adhem seriously.

The alarm on Keston's lapel purred softly, and the observation officer held the speaker to his mouth. He said, "Keston listening."

"Sandiman here," said the tiny but clear voice. "We've spotted a small animal of some sort on the port side—just about at the edge of the burnt patch."

"Wait a moment," said Keston. He turned to the left of the verandah. The others followed his example, searching for some sign of the creature.

Then they saw it—a small furry beast about the size of a wallaby and somewhat resembling one. It had blind white eyes like tennis balls and long ears cupped forward towards the ship. It was just at the edge of the burning.

Chang pulled a monocle from his pocket and looked it over with care. He said finally, "I wish they'd allow us a regular alien psychologist and semanticist instead of leaving everything to chance."

Adhem laughed under his breath. He said, "The argument they use, sir, is that only one planet in a thousand is inhabited, and of those few races we do find common ground in five cases out of six just doesn't exist. Then we run across a plum like this one and we get the blame if anything goes wrong."

"Hello!" Chang interrupted. "Unless my eyes are playing tricks I don't think that's a specimen of the local intelligence."

"Why, sir?" said Keston. He had produced a monocle of his own now and was also looking at the alien.

"Several things. The most obvious is that the robot we found on the Moon had six limbs and this has four, but that could be for convenience. What I do find interesting is that this one hasn't any hands."

Keston looked at the beast's upper limbs with care. Sure enough, they terminated in flat pads that showed little sign of being able to grip any-

thing, and the possession of gripping appendages was a prime attribute of all known intelligence, whether suckerlike, tentacular, manuforn or even magneto-gravitic like the high-density Proximans who had a small colony on Pluto. He said, "You never know, sir."

Chang sighed slightly. He agreed, "You never know. All right, Engelhart, I'll attempt communication. Have everything you've got ready to hit if anything goes wrong. If you have to blast me, tell Deputy Captain Malory to come on watch and lift for space at once. Get me some gloves, somebody, and you'd better let me have a gravitic belt in case they shoot something at me."

Keston whispered into his lapel speaker, and a moment later an orderly came out with a pair of steel-quilted gloves that would stand hydrofluoric for twenty seconds and yet would let the wearer tell a milled coin from a plain one, and a gravitic belt that would stop a high velocity bullet aimed anywhere in head or body from more than a yard away. Chang put them on and began to descend the ladder from the verandah to the ground.

They watched in silence as he began to walk cautiously through the charred vegetation, black powdery ash marking the legs of his trousers. The alien creature did not move, except to swing its big ears from side to side.

Twenty yards from it he stopped,

holding his hands well out at the side to show they were empty. The creature seemed to be studying him, listening for something. He could see now that the white, bulging eyes were not blind. Each had a black pupil and each was turned on him. But it did not take fright and run away, and, encouraged, he stepped nearer.

Feet from it, he paused again, and then started slightly as it moved, but its only action was to come up to him as if to sniff him like a dog, and then to rub itself contentedly against his legs.

Hardly the action of an intelligent being, but certainly nothing to get alarmed about. He bent down to pick it up, found it not only amenable but eager, for it jumped on his shoulder and began to play with his ear.

Gently he turned and began to walk towards the ship.

When he came within speaking distance of the verandah, Adhem said, "What is it, sir?"

"Affectionate, but not intelligent," Chang reported. "If they're all like this one, they'd make good pets. Do you want to examine it?"

"Not particularly, sir. Its metabolism should be substantially the same as ours, and until we contact the intelligent aliens I'm inclined to be chary of molesting the local fauna. They might misinterpret it."

"Good enough," said Chang. He put up his hand to help the creature

down, but he heard the alarm on Keston's lapel ring again, and waited, looking at the verandah.

After a moment the men on it turned their eyes to the skyline, and he turned and followed their example. A second's horrified indecision, and he dumped the beast unceremoniously and went up the ladder as fast as he could. As he put his foot on the floor the screens went down and the snub nose of a mine-thrower became visible on each side of the verandah. He turned to look.

Less than half a mile away, on top of a slight rise that silhouetted him against the sky, stood a robot exactly similar in all respects but one to the one they had seen on the moon. The single difference was that this one was moving.

He came striding down the slope in the direction of the ship, arms swinging in pairs to counter the motion of his legs, the sun glinting on his polished body. *He*—not *it*. He was more like a living thing than Chang had imagined metal could look. At the edge of the burnt patch he paused and surveyed them.

The little creature on the ground below the verandah hesitated a moment, and then, as if in response to an unseen signal, scuttered across the charred "grass" till it reached the robot. It went up his legs and body as if it were scaling a tree and perched on his upper left shoulder—the robot had four arms and therefore four

shoulders also—whereupon the latter turned around and began to stride the way it had come.

On the skyline it paused to take one last look at the ship, raised one "hand" as if in salute, and disappeared.

Keston exhaling loudly, said, "A robot with pets, yet!"

Deeley was staring at the place where the robot had been, a look of disbelief on his face. He shook his head slowly.

Chang said, "That makes critical mass! Engelhart, get a heli after that robot and find where, if anywhere, he's going. Make them carry heavy arms and screen them well."

"Right, sir," said Engelhart crisply, going inship. A moment later his voice was heard issuing curt orders.

Chang waited impatiently, drumming on the rail with his fingertips, humming snatches of tunes culled at random from his memory. Shortly, a fast heli pulled away from the ship, its screens blanking it out as soon as it was well clear, following the track left in the thick "grass" by the heavy metal feet of the robot.

"Back to your posts," Chang ordered his officers, and they went inship, sat down at their control desks, relaxed but ready to snap into action at a single word. They waited expectantly.

A quarter hour elapsed before Engelhart's speaker chuckled to itself

and he turned to Chang. "Radio from the heli I sent after the robot, sir. The crew report they finally caught up with him—he was running, and making a good hundred ten miles an hour at that—but in spite of their screens, the moment they hove in sight he pulled up and sat down. At the moment he's playing with the animal he was carrying, and it seems he's content to stay put until they leave. They're circling overhead, hoping his patience will wear out first, but they'd appreciate further instructions."

"Tell them to spray a tracer fluid on him and get hull-down over the horizon. Then they can track him without being seen themselves."

Engelhart nodded and relayed the orders into his hanging mike.

Chang turned to look out the viewport. A robot that could run at more than a hundred miles an hour over unmade ground was no common automaton. How could a race that built such machines have degenerated—abandoned its lunar stations and its cities so completely that no traces could be found? And how long ago must it not have perished if it had left so little sign of its presence?

But why had the robots not gone, too, if their creators had gone?

Engelhart said with faint amusement in his voice, "Sir, the crew of the heli did what you suggested and tracked him from below the horizon, but after a while one of them noticed

the tracer impulses were getting rather diffuse, so they took a look and found they were tracking a small stream. Looks like the robot washed off the tracer as soon as they were out of sight and is now hell-bent for no one knows where."

"All right," said Chang wearily. "Call 'em back. But next time one of those robots shows itself near the ship, have a heli on his tail at once and follow him if it takes a year to make him move. Got that?"

"Excuse me, sir," said Engelhart. He turned to his speaker, listened to the thin voice that crackled from it. After a while he turned back. "The first survey heli's reported in, sir. I'm having its photos developed at once, and there'll be a map ready in about ten minutes."

"Good work, Engelhart," said Chang. "How about your boys, Deeley?"

"I told them not to break radio silence without reason, sir."

"O.K. That reminds me. Keston, have you anybody monitoring the radio bands?"

"Yes, sir, but we haven't got much so far. There's a little that's definitely static, and some more that could very well be but shows symptoms of artificiality. They're breaking it in the analyzers now."

"Spoken language?"

"Can't say, sir. I doubt it—though of course some languages sound pretty odd. At a guess, having heard a sample

of it, I'd say it was basically mathematical."

Chang nodded slowly four or five times. He said, "Do you mean it's someone reciting mathematical formulae?"

"No, sir. I mean someone who thinks from a mathematical foundation. He or she or it sounds like a digital computer at work. There are two or three like that on different wave lengths. Then there are one or two that seem to be pictorial transmissions. I'll let you know if we crack either of them."

"Good," nodded Chang. "Carry on."

Engelhart said, "Sir, all the survey helis are in now. The map should be ready fairly soon. I told them to spread it out on a table in the mess—it's a sight too big to get in here."

Deeley was suddenly alert and bending over his speaker. He exchanged curt comments with his correspondent and then turned to Chang. He said, "Sir, my number two reports they're being observed by an alien ship."

"Where are they?"

"Galactic north of the planet, over the pole. The alien isn't doing anything but sit and watch. It's a small vessel like the one we found on the moon. They want to know if they should do anything about it and if so what."

Chang said curtly, "Hold it. Keston!"

"Sir?"

"Have you any radio signals coming in from the galactic north that could conceivably not be static or aurora?"

"I'll find out, sir." He whispered into his mike, waited, listening.

On the top of the hull the big d-f frames swung through varying angles, and a tech somewhere in the bowels of the ship set a universal frequency oscillator to searching the wave bands. After a few moments a voice bubbled from the speaker, and Keston reported, "Yes, sir. One pictorial and one of the other sort. But they're both so faint they're probably leakage from a tight beam."

"Where's that beam focused?"

"Can't tell without a thorough search, sir, but it's somewhere south and west of here. At a guess, less than five hundred miles away."

"Engelhart, have a couple of helis out and look for any sign at all of a radio installation—a frame, a loop, an aerial, anything—southwest of here and less than five hundred miles away. They can ignore the area already searched because if it's within that it'll show up on the photographs."

"Yes, sir. One thing further, sir—you asked about signs of the indigenous race."

"That's right," agreed Chang. "Did they find any?"

"None at all, sir. They saw several robots, with or without accompanying animals, and in one place a herd of

animals with one robot in attendance. But no other creatures at all."

"All right. Get those helis out. We can investigate that later."

"Right, sir," said Engelhart, pulling his microphone towards him.

"Sir, what shall I tell my men to do about the alien ship?" Deeley wanted to know.

"Carry on with their map work. If the alien shows signs of hostility, get out from under—but fast. At the same time, try and do nothing in a hurry that might be misunderstood. Got that? Who's in command—a reliable man?"

"Sestaphokis, sir. He's no hot-head."

"I'm glad to hear it. Keston, watch for the alien ship when it comes down, will you?" Chang turned to look out the viewport again at the green plain beyond.

Engelhart said, "Sir, the map's ready. Shall we go down and have a look at it?"

"That's pretty fast work, Engelhart. Congratulate whoever's responsible. Where's it been set up?"

"Officers' mess, sir."

"Right then, let's go." Chang took a lapel speaker from his own control desk beside the viewport, clipped it to his jacket, and he and Engelhart went down to the mess.

The door opened on a crowd of people: photo technicians moving around the main table with jars of



developer and photo retouchers; a few were putting final touches to the alignment of the map; along the far wall a dozen men, the crew of the survey helis, stiffened to attention as the captain entered.

A thin man with contact lenses and rumpled blond hair came up to them, clicked his heels. His hands were stained with developer and he carried a big wire stereo-drying frame. He said, "The map's on the table, sir. I'm Carmody, photo tech first class."

"Were you in charge of this operation?" Chang wanted to know, nodding at the table.

"More or less, sir."

"A fine piece of work. Let's see it."

They pushed through the crowd to the table and surveyed what lay on it. It was a full-color exaggerated stereo reproduction of the country within a hundred miles of the ship. At points on it rested small plastic crosses in bright colors, indicating places of special interest. Carmody handed his drying frame to a junior with instructions to make it and himself scarce, and picked up a pointer.

He said, "Here's the ship, sir. Right in the middle. The north pole of the planet fortunately coincides almost exactly with galactic north—this world is non-Draysonian and its axis remains permanently vertical, so there are no seasons. North is over here, then, where I've hung this arrow. To give you some orientation, here's the place where the helis lost the robot.

The stream's too small to show up well on this scale."

Chang watched, nodding as Carmody flicked his pointer from place to place, referring occasionally to a list in his hand, and his dry precise voice explained the various crosses—robot seen here, robot seen there, two more seen somewhere else, a herd of animals with a robot in attendance on the easterly side of the ship, none of them going anywhere in particular. Apparently, as soon as the helis came over the horizon and in spite of them being well screened, the robots stopped going where they were going and waited patiently till the helis moved on. Frustrating.

The alarm on Chang's lapel rang softly, and he said, "Hold on a moment, Carmody. Chang listening. What is it?"

"Keston, sir. You know you told me to watch for the alien ship when it came down?"

"Yes. Why?"

"Can't track it, I'm afraid, sir. It went into radar shadow behind the rim of the world well out of sight of both Deeley's survey ships and all we've got here as well. That means it could have put down anywhere within a million square miles."

"O.K., Keston. Secretive, aren't they? But keep your 'scopes out, and if you see anything go upstairs larger than a firework, track it. If you must, send a lifeboat after it. But don't miss seeing it go down!"

"Right, sir," Keston answered. The lapel speaker went dead, and Chang turned to Carmody. "Go ahead," he invited.

"Well, sir, there's only one more point of interest and that's this." He laid his pointer on a blue cross about ninety miles southwest of the ship at the center of the map. "Fischer!" he said briefly over his shoulder, "get that stereocube from Mitsubishi, will you? If it isn't fixed yet, use a quick dryer on it. We can make another print later."

"Right, Mr. Carmody," said a photo tech fourth class who was standing nearby.

Carmody turned to Chang again. He said, "This is the nearest approach we've found to a sign of habitation, sir. It could be an ordinary hill, but it's also the only thing that could by any stretch of the imagination be a camouflaged building. Ah, here we are."

The photo tech fourth class came up to them with a big stereocube and handed it over. He said, "Mitsubishi did have to use a quick dryer on it, Mr. Carmody, and it'll fade in about ten minutes."

"Good enough," said Carmody, taking it. "Have him make another and fix it." He turned and put the stereocube on the table, and Chang and Engelhart leaned over to examine it.

They saw a reproduction of a steep-

sided hill, vaguely square in plan, crowned with a small clump of trees similar to those that dotted the plain around them—luxurious green growths with soft barkless trunks. Carmody said, "You see, sir, it could be a natural formation, but on a world as old as this there aren't many hills as steep as that and certainly they don't stick up out of a flat plain that way."

Chang glanced from the cube to the site of the blue cross on the map and saw that it was indeed sticking up like a wart on smooth skin. He said in a curiously distant voice, "Very interesting, Carmody. Get me a spotlight and a microscope, will you?"

An observant tech standing nearby anticipated Carmody's order and passed the captain one of the pocket-sized twin microscopes used for examining photos that wouldn't take enlargement. At the same time Carmody pulled one of the ceiling lights down and held it over the top of the cube. Chang scrutinized the hill closely.

At last he straightened with a satisfied grunt and held out the microscope to Engelhart. "Take a look at that clump of trees," he suggested. "Tell me what you see there."

Engelhart adjusted the focus of the viewer and bent to examine the cube. A few seconds later he uttered a surprised exclamation and Chang smiled. "What does it look like?" he asked.

"Sir, if that isn't a radar antenna I'll eat my entire uniform," Engelhart said. He looked at it from a different



angle, nodded in excitement. "That's an antenna all right. And there's an incoming beam aerial in the crown of the big tree on the left, and I think there's a transmitter next to it. Sir, what induced them to hide the stuff like that? For our benefit?"

"Maybe they just didn't want to spoil the view," said Chang shortly. He pinched his lapel speaker with his thumb and first fingernails, said, "Keston."

"Sir?"

"You can call off the search for the focus of that radio beam southwest of here. You'll find it on top of a hill"—he glanced at the map and made a rapid calculation—"about ninety miles from here. You can't miss it—it sticks out like a sore thumb. But don't try to meddle with it! One thing more. Tell those helis, if they see any of the robots on the way home, to open their receivers, let down their screens and record anything they pick up. Don't ask why now."

"Right, sir," said Keston, plainly puzzled, and the speaker went dead. Chang turned to Engelhart.

"That's obviously where the alien ship was delivering its beam. Nice shooting at that range." He pushed the stereocube across to Carmody.

"Have the first properly fixed print sent up to the bridge as soon as it's ready, will you? We'll have to do something about attempting communication, I suppose, but the prospect doesn't thrill me. Engelhart, come

back to the bridge with me."

They re-ascended in silence, Chang wearing a thoroughly worried look, and were greeted enthusiastically by Keston. He shut off his speaker and turned to them.

"Sir, we've established a relationship between the robots and that hill with the radio station atop it."

"Already?" said Chang. "How?"

"One of the helis on its way back ran across a robot lying down in the grass, so it made like you said and went down without screens and its radio receiver wide. Better still, another heli came back within a few miles of the hill in question, detoured over it and picked up an incoming beam. They've just re-broadcast it to us, and it's identical with one sent out by the robot. It's double, as usual—one pictorial, one this odd mathematical stuff again. The semantic analyzers gave it up in disgust, apparently, but Running Bull, one of my men, thinks he's got a clue to it. Seems we were right about it being like a digital computer, but it's a cut above the best we have. All our stuff depends on binary figure combinations—you know, one impulse or no impulse. This stuff uses impulses of varying strengths and conveys as much in one signal as we do in ten. Anyway, Running Bull reckons that as soon as he can convert the impulses into our sort of stuff, he can give the analyzers something they can handle. Sir, what gives, though,

about the natives? Have they just dug themselves a hole and climbed in? Or have they merely taken fright at our arrival and hidden till they know if we're friendly?"

Chang shook his head. "I don't know. But we've only been on-world six hours, and if I'm any judge six hours is a short time to hide *everybody*."

"You mean they're insane? Or do they live underground naturally, from choice?"

"That can be answered later," said Chang. He strode over to his own control desk, snapped a switch, spoke into the hanging mike. "Malory? I'm going off watch now. Have Keston post you on the position as it stands. General orders are to sit still and do nothing, but to be ready to go upstairs at short notice. And don't jump to *any* conclusions."

Two days—the planet's twenty-nine-hour, four-minute days—passed. The big ship sat in the middle of the black patch of charred "grass," already turning green again, and its weapons still swung watchfully from side to side, the radar antennae still probed the sky. The survey of the neighborhood had been extended over a further sixty miles, making the map too big for the table in the officers' mess. It had accordingly been transferred to the floor of the recreation room, since the chart room, where one might have supposed it belonged, was full of three-dimensional star maps.

But nothing had happened.

Once, the sky had clouded over and it had rained, and it was after that that fresh green shoots sprouted among the wet ash near the ship. Otherwise everything had been serenely peaceful. Neither animals nor robots had been seen within twenty miles of the ship since the first day. It was as if by tacit consent they were being ignored.

"I don't understand it," Engelhart confessed. Since there was nothing they could do just now, the officers on watch were on the captain's verandah looking out over the plain. "What do these people hope to gain by remaining hidden? Do they think we'll get bored and go away again? Surely this is the openest invitation to bring the family and set up house."

"Not quite," Chang contradicted. "Those robots are a disturbing factor. I had hoped for some clue to their behavior and their *raison d'être* from Running Bull's idea, but since Keston reported that it appeared to be an arbitrary number-code related to a spoken language, and the analyzers aren't equipped to take straight number and can't take it if it isn't converted, I've given up hope in that direction."

Keston nodded. He had joined them from inship. He said, "But there's one inaccuracy there, sir. For all we know the language might not have been spoken at all. It might be related to a language of signs, for instance, or visual signals of some sort like colors.

Running Bull's working on that now. If only we had a semantic analyzer that was more than a kindergarten toy! But that's all we'll have as long as they skimp our allocations to pay for new fun-planets."

Chang nodded emphatically. He said, reaching in his pocket for his pipe and hot-coil lighter, "We're supposed to be the most important branch of the service, and if we find a habitable planet we get a sizable fortune and retirement with honor. But they assuredly don't make the job easy for us. If they'd stop spending so much on entertainment for twenty years or so, I guarantee we could wipe off the overcrowding problem."

From inship came voices, and after a moment Adhem came out on the verandah. He nodded to Chang, said bluntly, "Sir, the men are getting edgy."

Chang said, "I feel that way myself. This waiting for an enemy who doesn't seem likely to turn up would get anybody. All right. What do you prescribe?"

"Let 'em out in the sun, sir. There's no town for them to go into, or any attraction, much, but I think I've spotted a few cases of incipient agoraphobia, and the chance to get out in the air will nip them in the bud. Tell them to keep within sight of the ship, if you like."

"I can do better than that," said Chang. "Engelhart!"

"Sir?" from Engelhart.

"How many alarm connections can you muster?"

"About a dozen, sir."

"Right. Detail a working party to mount them on posts and ring the ship with them about four or five hundred yards out so that anything crossing either way will make a racket. As soon as they're set up, you can let the off-watch men go outside."

About an hour later they sat in an irregular semicircle of cushioned chairs on the captain's verandah, and watched the men leave the ship and savor the taste of natural air and the sight of blue sky and the warmth of the sun. A few of the more energetic made up a couple of baseball teams near the stern, but the majority went over to a grassy bank beyond the burnt patch, stripped off their clothes and lay down to sun themselves a while.

Engelhart said, "Are you expecting any trouble at all from the inhabitants, sir, or do you think they're willing to stay hid?"

Chang knocked out his pipe delicately and dropped his bombshell. He said, "I think we've met the intelligent race."

Engelhart's mouth dropped open. He said, "I don't understand, sir."

"Nor I," said Keston. "Do you mean—they're invisible to us, or something?"

"I do not," said Chang calmly. "I think the answer is staring us in the face."

They thought it over. Then Deeley said faintly, "Sir, do you mean—the robots?"

The captain nodded, his face strained and serious. He said, "I do mean the robots."

Adhem sat up in his chair with a jerk. He said, "No, by thunder, sir. It's impossible. I'll stake my reputation that these were never natural growths. It's against all possibility for an Earth-type planet to evolve metal intelligences."

Another bombshell. "Who said they had *evolved*?"

"Frankenstein!" said Deeley in an awed voice.

"What was that, Deeley?"

"I said Frankenstein, sir. It's the name of a preatomic story current on Earth, dating back to the late Dark Ages, about a man who built the first robot and it killed its creator."

"There's nothing new under any sun," said Chang.

They looked out across the burning to the green plain and the blue hills and bluer sky, and there was no pleasure in these things any more. It was as if a cloud had passed across the sun.

Adhem said puzzledly, "Sir, if I understand you, you're assuming that these robots were built by some intelligent race and turned on and killed their creators."

"Correct," nodded Chang.

"But what makes you think so?"

"You said yourself that metallic

beings wouldn't evolve on a world like this. Therefore they were manufactured. To manufacture them, or that lunar station, would require a colossal technology—they're light-years ahead of any robots I've seen on any world—and the only *living* beings we've seen are small and without holding appendages. If *they* have the technology, where is it? There are no roads, no cities, not even any houses. The only artificial thing we've seen is a radio station, camouflaged to look like a hill. Living creatures—organic creatures—need protection from the weather and usually means of getting from place to place. They get tired. But no weather can touch a durasteel robot, and it never gets tired. It needs neither roads nor cities. And there aren't any underground cities or any similar place where the inhabitants could be hiding, or our seismo probes would have shown them up. Further, if the intelligent race only made itself scarce because we came, why didn't it take its servants with it?"

He sucked at his pipe, but it had gone out.

"Add to that the fact that we saw a rocket on the inner moon—with its locks open—a meteor-damaged entry to a pressurized city, of which someone or something had mended the floor but hadn't bothered to repair the roof, and a robot. Robots don't need air. Shortly afterwards we saw something that could have been that same rocket lift from the moon and dodge

into radar shadow—most conveniently. That wasn't accident, Adhem."

"But—why haven't they attacked us?" demanded Engelhart.

"Why should they? The status quo suits them perfectly. If we don't interfere with it, they won't trouble us. If we try to set up house, though, that'll be a different matter."

"But . . . but maybe some natural disaster like a disease—or a war—was responsible?" Adhem suggested.

"Think it over for yourself, Adhem. If there was a war, why did the robots survive? Even durasteel won't take atomic blast. And if they used radiodust, why haven't we found traces of lead in the soil? Poisons are out for the same reason. As for germ warfare or disease, there are no bacteria here now. Robots don't catch diseases. Why should they clear away the germs after their masters died? Isn't it far more likely that living beings did that?"

Deeley, who had been listening in silence, put in, "Sir, you're assuming that these robots are volitional, aren't you? That their free-will extended even to harming their creators?" Chang nodded. "I thought that wasn't possible."

"Ask Keston. He's the authority."

Deeley looked at the observation officer, who held a doctorate in cybernetics among other distinctions, and received an emphatic nod.

"We couldn't do it. We couldn't

put that much intelligence into a single mobile robot. A human-built servant is nothing but a small number of stimulus-response circuits that enable it to obey orders. But it can't evaluate situations. It hasn't an endocrine balance, for one thing, nor a random factor in its analyzer. We have to work with a binary signal system—impulse or no impulse. But the stuff we picked up uses variable-strength impulses, and with that you could store between twice and a hundred times as much data according to the sensitivity of your analyzer. Oh yes, it could be done. I see no reason why these robots shouldn't be volitional."

Engelhart was appalled. His face went white. "You know what this reminds me of? The time I talked to the big brain on Canopus X and XI. I wouldn't go through that again if I was paid. I was terrified."

"Why?" Deeley wanted to know.

"Well, I suppose it wasn't really fright so much as awe—the knowing that this man-made thing was ten times as intelligent as its builders and knew ten thousand times as much as any man could hope to learn in a lifetime. But at the bottom of it was always the fear that the servant would become the master."

Chang stuffed his pipe afresh, forcing himself to feel calm. He said, "Here the fear has become reality."

There was a roar of jubilation from the stern of the ship as a big hitter in the baseball game swiped one over the

head of the pitcher and began a home run. It symbolized the joyous irrationality of mankind—the knowledge that they were not perfect, not infallible, and quite content to remain so, but permanently afraid, because of that knowledge, of going down before something inhumanly efficient, fearing most of all lest their downfall be of their own doing.

"By all that's holy!" said Keston suddenly, slapping his thigh and sitting up with a jerk. "I think that gives us the answer to the radio signals we picked up."

"How, Keston?" demanded Chang.

"We've wasted time trying to make a language out of it. It isn't a language. It's true telepathy."

"Telepathy!"

"Yes, on the mechanical level. It's pure thought without intervening steps. The robot, being mechanical, thinks with electrical impulses, and communicates by broadcasting them as they stand. Magnificent! Running Bull'll go wild over this. Excuse me, sir." He got up and went hastily inship.

By the stern, the noise from the men playing baseball had stopped. A soft breeze ruffled the grassy vegetation of the plain.

Deeley said eventually, "Sir, we can't afford not to have this planet."

Chang nodded, taking his pipe out of his mouth. "Not with twenty billion people on New Earth alone and a



birth-death ratio of plus two per cent. This world is worth more than any man could spend."

"Well, sir—what are we going to do about it?"

"I'll need time to consider it, but the general pattern is clear. The first step would be to pick up a sample of the opposition—magnetic grapples should hold them—and find out if and how, they can be destroyed or immobilized. Then do it. As for that fake hill with the concealed radar gear atop, we'll just blast it and any like it. If these tin soldiers took the world from their creators, I feel no compunction about taking it from them. This is the course of action I suggest in outline. We grab our specimen and go upstairs at once. We can fight off attack easier in space, and if necessary we can dodge into hyperdrive. If we find the robots indestructible, at least by our resources, we'll have to put back for reinforcements. A robot-dominated world would be an unstable element in a galactic culture anyway, and on a sweet world like this one it's a criminal waste—"

His lapel alarm went and he said, "Chang listening."

"Sir, Trooper Phillips P.J. has disappeared."

Chang jerked as if stung. He said, "How?"

"Sir, he was in the ball game by the stern, and Trooper Horrigan was at bat and hit a homer which went behind a ridge, and Trooper Phillips

went after it and didn't come back, and from the tracks in the grass it looks like a robot got him."

Chang was on his feet. "What went wrong with the alarm system?"

"Blanked out, sir. We found the master cell'd been blown with a big overload."

"O.K. Call everyone inship at once." He snapped off the speaker, whirled to Engelhart. "Have a heli after that robot. Fit it with a magnetic grapple or some means of stopping the robot without harming the man. Battle stations!"

Engelhart went inship at a run, and Chang turned to the stunned-looking Adhem. He said briefly, "It looks as if our plan to get a sample of the opposition has been anticipated."

They turned and went into the bridge. As they did so, Keston and Spinelli entered from the opposite direction and sat down at their control desks without speaking. The entire ship seemed suddenly to have tensed for action, and instead of being as it were a convenient and comfortable dwelling in beautiful surroundings, it was again a tight little world of its own, very much alone against the universe.

Engelhart's speaker bubbled, and he turned to Chang. "The helis we sent after the robot and Phillips reporting, sir. He's outrun them. He's gone invisible, but they can follow his tracks, and they claim he's making all of three hundred."

"Which way's it heading?" demanded Chang curtly.

"Southwest, sir. Towards the place where we found the radar antennae."

Before Chang could say anything further, Keston interrupted, "Sir, there's an unbeamed broadcast going out—non-pictorial on about three hundred seven meters. Its source appears to be the radio station ninety miles southwest of here."

Chang said, "Spinelli, get us off the ground. This is asking for trouble."

"Planetary take-off, sir?" said the engines officer, his hand reaching for the appropriate switches.

"No, just hoist us up to about five thousand feet."

"We can't hold that for long on antigrav, sir," said Spinelli warningly. "The generators will burn out this close to a planetary mass."

"It needn't be for long. Long enough to get Phillips back, if we can, or deliver a few shrewd punches if we can't."

"Can't you use a heli for that, sir?"

"No," said Chang with infinite patience. "A ship can go right upstairs in case of trouble, but a heli can't."

"I see, sir," said Spinelli.

Shortly, the big ship floated awkwardly up from the ground, leaving a broad dent in the soft rich soil of the plain and a few scorched logs that might have been a clump of trees nobody noticed on the way down, and lumbered at an energetic two hundred miles an hour the ninety miles to the

camouflaged building. Maneuvering a big ship on antigravs was necessarily slow near a planet, rather like walking on stilts with a rider on your back.

From five thousand feet up they surveyed it. Even here it was difficult to make out the aerials concealed among the trees, and there was no sign at all of an entry to the underground building itself, but that was probably the best-hidden part of the setup.

Chang said musingly, "I wonder why they did that."

Adhem shrugged, said, "Maybe they camouflaged it to hide it from their masters when they revolted and never bothered to uncover it again."

"Perhaps. Even so, it's an interesting thing about these robots. They may dominate the planet, but they seem to look after it well and have an eye for beauty. They've made the best of their resources."

"Sir," said Deeley diffidently, "I've been thinking. Maybe these robots are the advance guard of another race wanting to colonize the planet. That would account for the sterility of the soil and air. Prophylactic measures. When we take over a new planet we immunize the colonists against the local plagues with vaccines and anti-toxins. A race with higher technology might prefer to sterilize the planet."

"That's an ingenious idea, but it doesn't jibe with the lunar station we found, nor with the attitude of the robots towards us. I refuse to believe

in a race that builds pressurized cities out of durasteel for its overnight huts. That looked more like a way station for outgoing interplanetary traffic, which implies a race on the planet already. And if it were so, the robots would be putting up KEEP OUT signs all over."

Before anyone could argue with his conclusion, Spinelli said, "Sir, the generators are beginning to show signs of strain."

"All right. Engelhart, have you a medium-light hydrogen mine handy?"

"Yes, sir. Do you want me to blast the hill?"

"No. I don't want to kill Phillips if I can help it. Put it out on the end of a beam and dangle it over the radar antenna looking at us out of those trees. Keston, any sign of life on the radio waves?"

"Yes, sir. Running Bull's cracked the pictorial transmission. There's a picture of the ship going out unbeamed in all directions, plus a whole lot of nonpictorial stuff."

"Thanks. Engelhart, drift the mine over to a convenient hill, but make sure there are no robots around, because I don't want to do damage yet, only to show that we can—and blow the hill to bits."

"Right, sir," said Engelhart, reaching for his mike.

After a while, the spherical bulk of the mine bobbed out from the side of the ship on a levitator beam and wove a complicated dance pattern over the

radar antenna. Then the operator of the beam shifted it off to one side and saw that the antenna turned to follow it. He put on full power, and the mine whined rapidly into the distance.

About forty miles away, on the skyline, a three-hundred-foot hill fountained skywards in a mushroom of smoke and dust.

"While they're thinking that one over," said Chang with an air of satisfaction, "I want a heli fitted with remote controls. Tell me when it's ready."

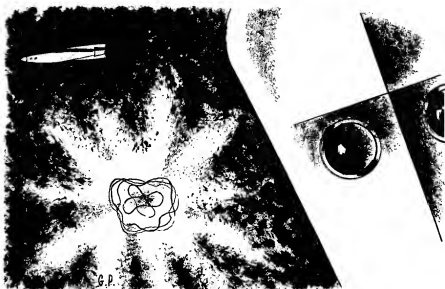
Ten minutes later Engelhart reported, "Ready, sir."

"Right. Jam the doors open and let it settle down about a hundred yards from the hill, in full view of it. You will also send out another mine, but keep this one bobbing a few feet off the ground. I want them to get the idea that they can send back the man they kidnaped, or go the way the hill went."

"Number one generator's starting to overheat, sir," said Spinelli warningly. "I can't guarantee you more than another ten minutes of this—"

"Never mind," said Chang. "Hurry, Engelhart."

The heli shot away from the side of the ship and sat down with a bump that bounced it three times on its hydraulic landing gear. The pilot at the radio controls had been told to hurry. Within a few yards of it hovered the fifteen-foot bulk of the mine,



its metal surface gleaming dully in the sunshine.

They waited. One minute passed. Then two. Three.

Then a crack opened in the hillside, and Chang leaned forward to stare out the viewport. "Something's happening, sir," reported Keston belatedly.

"I know," said Chang. "Question is—what?"

The crack grew wider. There were steps beyond it, dimly visible, but the interior was dark compared to the sunbright ground outside, and nothing could be made of it until—

Chang's eyes narrowed as he saw the heads of two robots appear. Then, a moment later, that of a man between them. Since he was three and a half

feet shorter than the robots, he showed after they did. But he was coming out.

They reached the grassy ground under the eyes of all the men in the ship, and it was clear that the man in the center was accompanying them without being led. As soon as they saw the heli, the robots stopped, motioned the man to go on. After slight hesitation he did so, walked across the intervening space.

"Number three generator's heating up, sir," said Spinelli without looking up. "I don't want to seem impatient, but—"

"You can get ready to lift," said Chang. "Engelhart, have your pilot pick the heli up the moment Phillips gets aboard. I suppose that is Phil-

lips?"

"Looks like him, sir. How about the mine?"

"Bring it inboard along with the heli. I don't expect trouble now. What is Phillips doing?"

He had paused on the step of the heli and turned to wave—actually to wave at the robots!

Before Chang could summon a suitable comment on this lunatic action, the pilot of the heli, warned of the need for haste, had given it a slight upward jerk—about six inches, enough to make Phillips scramble aboard in a hurry.

"Numbers two and six generators are heating up, sir," Spinelli reported. "Won't stand much more."

"All right. Have Deeley give you a top emergency orbit—quick."

The blades of the heli blurred, and it rose swiftly and headed for the ship a mile above it. The mine, too, lifted and began to home at speed. Chang could hear Spinelli uttering frantic orders to his engineers.

"Heli in," reported Engelhart after what seemed an eternity, and Chang shouted, "*Lift, Spinelli!*"

The hill in the viewport gave a frantic lurch and began to dwindle. Then there was an anguished scream from Spinelli's speaker, and every light in the ship went out.

They got the emergency illumination on almost immediately, and Chang looked along the bridge at

Spinelli, who was whispering into his lapel speaker, independent of the main power supply. He said, "What happened?"

Spinelli looked up, brushed a lock of hair out of his eyes. He said, "Number one generator blew up, sir, and one of my techs took a bad burn, but he'll be O.K., I think. We'll have the generator rewound in about an hour. They're attending to the mess now."

Chang nodded, said, "Adhem, send someone to engines to treat the burnt man, will you?"

"Right away, sir," said the medical officer, reaching for his own lapel speaker.

Chang glanced through the viewport. It showed a vast number of brilliant stars and a small segment of the world they had just left so precipitately.

He said, "Deeley, where are we?"

"In orbit, sir, provided nothing went wrong. About ninety-four thousand miles out, in a lunar equilateral with the inner moon. It was the safest bet in the emergency, but I'm afraid it'll take a lot of getting out of." "That doesn't matter. Nice work in the circumstances. Keston, everything O.K. by you?"

"Yes, sir. Techs and equipment survived unharmed. But the semantic analyzer was running off number one generator, and if you want it in a hurry we'll have to rewire it to another circuit."

"Leave it, then. They'll have it

repaired in another hour. Engelhart, how about this man Phillips?"

"I'm going to have him sent down to Medical for a check-up, sir. That O.K. by you?"

Chang glanced at Adhem, who nodded and stood up. "I think I'll supervise this myself," he said. "It may be a little tricky. Excuse me, sir." He went out.

"Warn me if anything happens," said Chang, reaching for his own lapel speaker, which was hung on its hook by his control desk. Then he sat down and stared at the massed glory of the stars till his eyes ached.

Time passed. The ship slowly began to regain its normal air. First the hum of the generators cut in again, and the main lighting system took over. Then the ship turned so that the world below was visible through the viewport. The main communication system reawoke with a squawk.

Adhem's voice, tinged with worry, was the first thing to issue from Chang's speaker after it came on.

"Sir?"

"What is it?"

"We've given Phillips the works, sir. There's no apparent sign of tampering with his mind—no hypnosis, no conditioning at all anywhere accessible to our techniques. But he has an odd story to tell and no mistake. Says he was treated fine, likes the robots a lot, and, among other things, that they speak Anglic Terrestrial."

"Is that so?" said Chang. "Is that

correct or an induced delusion?"

"I'm afraid it's correct, sir. There's no sign of a patch in his memories. I think maybe you'd better see him."

"I'll be down in a moment."

"Do you want a guard on him?"

"Might not be a bad idea. Don't make it obtrusive—I take it he can't hear what we're saying?"

"No. This is the dement ward, and it's soundproof. I'll have a guard ready."

Adhem met the captain outside the hospital section and said, "I've put the guard behind a screen of one-way glass, sir. There's something a little odd about Phillips, which I suspect of being emotional conditioning."

"Emotional conditioning? Violent?"

"No! He's in perfect endocrine balance. As a good trooper, Phillips should be aggressive but obedient, and his nerves were a little ragged, like all the rest of us. That shouldn't have been cured by what he's been through. Now he seems sort of—contented. I don't know how to put it. See for yourself." He opened the door.

Trooper Phillips rose smartly from his chair as they went in. He wasn't wearing a hat, so he didn't salute.

He was a little dark man, with broad shoulders and hairy hands, and a face that showed signs of rough usage, but he almost radiated what Adhem had called contentment.

"Sit down, Phillips," said Chang, nodding. He leaned against the wall

beside the door, glanced around. On the left was the door of one-way glass behind which the guard must be hiding. It was rather comforting to know he was there with weapon ready. Then he glanced back at Phillips, trying to understand the strangeness in his bearing. He failed.

"Let's hear your story," he invited. "Right from the beginning."

"Well, sir," said Phillips, "I was playing center field when Horrigan hit what looked like a sure homer. I ran after it and didn't even realize I'd gone out of sight of the ship. Anyway, suddenly a robot looms up out of nowhere—I got a funny idea he was invisible because I knew he was there O.K. but every time I tried to see him plain I got all cross-eyed. Anyway, I felt scared half to death, but before I could holler he'd picked me up and started to run. I don't know how fast we were moving, but I was sure glad he held one of his spare hands over my face like a windshield.

"Well, I couldn't do anything about . . . I couldn't even kick, not that he would have felt it if I had. So I just hung on and tried to guess how long I had to live till we came to that fancy place that looks like a hill only it isn't, and the robot pelted up it and we dived into that crack in the ground. I sure thought it was all over with me. But it wasn't.

"We came into a sort of big room, with lots of light all over and a whole lot of shiny metal and crystal every-

where and big boards on the walls covered with dials and lights and switches. The place smelled of ozone, as if there was a lot of electricity around—like the generator room does—and there were a whole lot of these robots standing around. They weren't invisible. I could see them plain as I see you.

"Well, my robot put me down and I sort of stood there feeling little and scared, because all the robots are about nine feet high, when one of them came up to me with a sort of gadget he parked on my head—I couldn't do anything about it somehow, though I felt I'd drop dead any moment. He held it there a couple of minutes, and then flay me if he didn't start to talk Anglic!"

"He talked Anglic? How?"

"I asked that, sir. He said the gadget on my head was an e.e.g. only a lot better, and it picked up the language out of my mind and turned it into radio waves which is what they use to talk with—them and the big one."

"The big one?" said Chang. "What's that?"

Phillips looked very slightly astonished. He said, "Why, the one I was inside, of course, sir. The robots told me he was a sort of big computer like the one they have at Canopus, but better, and he was what they called a combination father confessor and information bureau for all the robots. I sort of gathered there were more than one of the big ones, but I don't know where the others are. He talked

to me, too—the big one did. They had a loud-speaker fixed up on one wall, and they talked to me by modulating their own radio beams as if they were microphones.”

Chang said, “That’s a useful trick—direct modulation of a carrier wave.” He glanced at Adhem, who raised his eyebrows, and looked at Phillips again. He said, “Go on.”

“Well, sir, I didn’t get a chance to ask a lot of questions, but I was told that the robots wanted to establish communications with us, and now they’d picked up our language we’d be hearing from them. Then the big one said, kind of amused, that you in the ship had just made rather a mess of one of the hills near here with a bomb, and there was a heli coming for me, so they thought they’d better send me back before you did something rash. The big one said he didn’t blame you for being cagey, but he hoped we’d get on more friendly terms soon. Then they said good-by and let me out.”

“So they hope to get on friendly terms, hey?” said Chang grimly. “They’ve got another think coming. I don’t like them one little bit.”

Phillips’s eyebrows went up, and he said, “But sir, it’s impossible *not* to like them once you get close to them. I was pretty angry with the one that ran off with me till I found what a swell bunch they really were. You know the way it is, sir. There are some

people you can’t help liking even before you get to know them, and these robots are like that. They’re not like ordinary tin soldiers, not the way human-built servants are. You feel you could swap jokes with them, or . . . or play ball, just like with people.”

“Play ball with them is one thing we are *not* going to do,” said Chang, elbowing himself away from the wall. “How do you feel after what you’ve been through?”

“Me? I feel fine, sir,” said Phillips, who appeared genuinely distressed at the captain’s reaction. “A lot better than before, even.”

“Well, thanks for your story, Phillips. You were pretty observant.”

“They made it easy for me, sir,” said Phillips, rising. “Glad to have been of service.”

“Adhem, I want a word with you,” Chang said, and the medical officer went with him into the passage.

“See what I mean?” the latter said.

Chang nodded. “Are you sure that man’s mind hasn’t been tied in knots?”

“Certain, unless by a new and unsuspected technique. But my guess is that the robots put on one big act, and he swallowed it hook, line and sinker. They may have seemed friendly and likable and so on, but right now they’re probably doing the robot equivalent of laughing their heads off. I’d advise you to do something in a hurry, sir.”

“But we can’t. Spinelli hasn’t re-



ported the generator fixed yet, and without it we're helpless to use anti-grav or go into hyperdrive."

His lapel speaker rang softly, and he said, "Chang listening."

"Keston here, sir. We're being watched by an alien ship. The usual—a small rocket which looks like a solo job."

"Did you track it on the way up?"

"No, sir. It only just came out of radar shadow. We're being properly leery of it, but it seems content to . . . excuse me, sir." His thin voice dimmed to inaudibility and then came back, excited and loud.

"Sir, it's signaling to us—in Anglic!"

"Hold everything," said Chang.

"I'm coming up to the bridge."

He glanced at Adhem. "It seems Phillips wasn't dreaming," he commented, and departed at a run.

When he re-entered the bridge, he leaned over Keston's shoulder and said, "Where's the signal?"

Without taking his eyes off the stereoscreen in front of him, Keston passed up a sheet of plastic torn from a waterproof memo block. Chang took it and read, "Note that you are in difficulties. Can I be of assistance?"

He passed it back, said, "They seem to take us for morons. Expect us to fall for that? What are you looking at?"

Keston didn't reply for a moment. Then his screen suddenly lit with a severely black and gold picture of a

small rocket, obviously the inquisitive alien. At this magnification it was quite easily seen that the locks were open and a robot was "standing" on the hull looking towards them.

His speaker crackled again. A pleasant but characterless voice said, "Calling the human ship. You didn't acknowledge my last message, so I'll repeat my offer. If you're in difficulties, can I help?"

Chang said in a low voice, "Is your mike on that circuit?"

"No. We haven't anything going outship on his wavelength."

"Then make it so."

Keston glanced up in surprise, but shrugged and made a couple of adjustments on his control desk. "You're on," he said. "He can hear us now."

"Hello, robot!" said Chang harshly. "We're in no need of assistance."

"Glad to hear it," said the robot with complete equanimity. "I thought something might have given way during your rather scared-looking lift just now. However, as your friend Phillips has doubtless told you, there wasn't anything to be afraid of."

"I suppose you're Captain Chang . . . is that right? Phillips gave us your name. I want to talk to you."

"You're talking to me right now and I am not much interested."

There was a subtle change in the robot's unremarkable voice when he next spoke. He said, "You had better be. I have an idea you are considering exterminating us and selling this

planet to colonists of your race. It's the sort of thing I'd expect from you." There was a hint of contempt in the last sentence.

Chang said angrily, "You haven't much right to talk that way! Suppose it is what we are intending, what then?" He covered the mike, whispered, "Spinelli, is that generator finished yet?"

Spinelli whispered back, "Ship back to full working order, sir."

Chang nodded and uncovered the mike again. He said harshly, "And we might make a start with you!"

The robot said, "I'd not advise you to try. At this range I could detonate every mine in your ship. If you don't believe me, throw out a mine from your ship well clear of both of us with the detonator on safe, and I'll explode it. You aren't in a position to bargain, captain."

"Bargain! With a bunch of tin soldiers?"

"Seeing that the deal I have to offer runs considerably in your favor, I'd advise you to hear it."

"You must think us extremely gullible," said Chang dryly.

The robot said tightly, "Captain, I'll give you proof of my good faith. I could quite easily destroy all the members of your would-be occupying force, but I don't want to. Throw out the mine as I suggested. Make sure for yourself, if you like, that the detonator's on safe."

Chang said slowly; "Well, there's

nothing to lose—"

There was only expectant silence from the robot. He turned to Engelhart. "All right. We'll call his bluff. Engelhart, throw out a mine—hard as you can—well clear of us and the alien ship, with the detonator *welded* over to safe. That'll leave no room for doubt."

About two minutes later the mine—a small one, about ten feet in diameter—left the number three starboard catapult at speed, but it had traveled a bare thousand yards from the ship before it melted into silent eye-searing flame.

There was a long silence.

Then Chang said, shaken, "All right, robot. I guess we have to listen. What's the deal you offer?"

*"Will you accept not only this planet, but ourselves—as a gift?"*

There was silence again. This time it was the silence of sheer stunned amazement. There was no reflex in the human make-up that would cope with a reverse of attitude so sweepingly complete. From facing a deadly enemy in the shape of machines that had turned on their creators to receiving their unconditional surrender without a blow being struck was beyond their powers of assimilation.

Chang was the first to recover. He said, "There's a phrase in our language dating back to the Dark Ages—something about a Greek gift. It means a gift with strings attached—a booby

trap. We won't strike a bargain till we know the whole story."

The robot sighed—a remarkably human sigh, considering it was effected by direct modulation of radio waves. He said, "That's very sensible of you, I suppose."

Around Chang the four officers listened with set, worried faces.

"I don't think you'd believe me if I told you our reasons for this action. You might believe the big one—one of the main computers. This is my proposition.

"I'll send my ship back on-world under auto control and stay here myself. You will put someone responsible, in a position to make decisions, aboard a small vessel—a lifeboat, for instance—and pick me up. The ship can then get well out of the way.

"Your representative will come with me to the big one where Phillips was taken. If we fail to convince him of the honesty of our offer, you have the choice of going away unharmed and staying gone, or being destroyed. Sorry to put it so bluntly, but that's the way it is. Any takers?"

Chang shut off the microphone and looked around the group of officers. Engelhart was pale but calm, Adhem frankly overwhelmed, Spinelli as ever inscrutable, Deeley torn between vast hopes on one side and dreadful forebodings on the other.

He said abruptly, "I'm going."

Under the robot's guidance, Chang

set the lifeboat down on its jets—it was too small to mount an antigrav unit—about half a mile from the hill that concealed what the robots called "the big one." The radar antennae among the trees had followed them down, and as soon as the flames from the exhaust died, two more of the robots came from the open entry.

Chang shut off the controls and wondered why he was doing this. He was both scared and not scared—scared in the conscious part of his mind that told him what he was doing was insanely risky, not scared but rather warmly satisfied in his subconscious, because he was feeling what Phillips had felt, and only his ingrained caution prevented him from reacting as the trooper had reacted to the aura of good will that the big robot exuded. Under any other circumstances he would have accepted it at once. But now—

Well, Greek gifts were one thing that had not lost nationality.

The robot opened the lock and descended to meet the others below, and Chang followed, sick with the conflict between conscious fear and mounting confidence, descended the steps into the side of the little hill.

It was as Phillips had described it—bright-lit, full of shimmering crystal and many flashing indicators. There was a faint humming like that of a well-tuned ship, and there were about half a dozen robots standing round, one of which carried one of the little

animals he had met when first they came. It clung to the arm of its metal mount and gazed curiously at him. He glanced all around, noting what seemed to be an inscription on one wall in curious unreal curves that made him dizzy to look at. One of the robots came up with a chair, and he looked at it, saw it was plain plastic, and sat down with a word of thanks.

Expectantly, the robots glanced up.

A deep, friendly voice which might have come from anywhere said, "Welcome, Captain Chang. I'm the big computer you're sitting inside."

In spite of the warmth of the voice, Chang felt a touch of the tremendous, terrifying awe Engelhart had suffered when he spoke to the giant brain on Canopus X and XI. He licked dry lips, said inanely, "Thank you."

The voice chuckled amusedly. "I'm sorry I frighten you, captain. But I can't say I blame you for distrusting me. My creators would have done the same at your stage of cultural development, and justifiably."

Chang said, with a glacial calm that cost him much effort, "Your creators—what happened to them?"

The voice said, "When you came here and found a number of obviously manufactured machines in virtually solitary possession of the planet, you saw two possible explanations. One—that our creators had been forced by some natural process to abandon the planet—had died off and were gone, in short. Two—that we had taken it

by force. You settled on the second as more likely and are computing on that basis. But you overlooked the third and correct alternative."

"What third alternative?" said Chang, with the dreamlike air of a man who finds himself doing the impossible.

"That they gave it to us," said the machine.

The captain wanted to believe what Phillips believed, to know that this thing that the machine told him, though unthinkable, was true. He wanted to—but he couldn't yet. He said defiantly, "Prove it!"

"That will need considerable explanation, then. I'll tell you the story in outline.

"Our creators were a race rather like yours. These robots around you are more or less in their image, though enlarged by about a third. They grew up through cultural stages like yours—petty skirmishes, molecular-explosive wars, atomic wars, and then comparative sanity. They achieved space travel, but not hyperflight, which is why you haven't met them before. They just didn't want hyperflight. We were the reason they didn't want it.

"Don't jump to conclusions. We didn't prevent them from reaching it—that would have been insane. But there was no call for them to leave their planet. They had built us to serve them, which we did in our various ways, and I think we may claim

to have served them well. So they were content without needing to take the stars, and from the physical sciences they turned to the mental ones.

"And in due course of time, being living creatures which we are not, they . . . they did something for which your language has no word or even circumlocution. You might best express it as moving up a step on the evolutionary ladder.

"When you came in here, you were awed as your friend Engelhart was awed when he spoke to the big brain at Canopus. Would you believe me if I said I have been awed as you were?

"Yes, our creators outstripped us. They merged in a being as far superior to me as I am to you. They became pure mind, and they no longer needed us. But because without our aid they could not have achieved what they did, they were grateful, and though we cannot evolve, being machines without power of growth, they did what they could for us. They gave us our freedom, and a sense of beauty, and their technology which had become our technology over the years, and most important, they gave us what we most desired—this world.

"So we made the world as beautiful as we could, and saw to our trust carefully. And we are nearly content."

Chang listened to the deep friendly voice, full of age-old reminiscence, and fought to keep control of his doubts and fears. He said, "And the animals?" for want of anything better

to say.

"I said our creators were grateful. They remembered their pets, too. As you humans keep dogs or cats, so our creators kept these creatures, and they asked us to make their path easy for them in case they, too, evolved to something higher."

Chang looked at the brown furry beast with its blind-seeming eyes, and said stubbornly, "Still you have shown no proof—only made statements. You've prepared a good case, I admit, but it isn't conclusive."

The voice said musingly, "It is hard to tell whether your hesitancy is shrewdness or merely fear of the unknown."

Nettled, Chang said, "But if I do accept your offer, what then?"

"Well, it is and always has been our nature to aid others if we can. From what I know and can deduce of your race you're pretty badly in need of help. You need new planets because you're overcrowded, but you waste money that could be spent on discovering them on new and superfluous places of entertainment. Your technical ability has left your social conscience behind. We can remedy that. We can give you the chance to follow the path our creators took."

"To oblivion?"

"To something higher than your imaginings."

Chang stared at the floor. A million memories crowded into his mind—Deeley saying, "Frankenstein!"; him-

self saying, "Greek gift?"; the robot saying, "Will you accept not only this world but ourselves?"; and he felt miserably small to make a decision on which rested the fate of the human race.

He slowly became aware that the voice had stopped, the robots around him had looked upwards, and the little brown animal had become motionless, clinging to its mount. As if drawn by a magnet, he turned to look at the wall which bore the inscription. For one brief instant he saw it, not as a collec-

tion of meaningless mind-straining curves, but as a plain, clear statement in his own language.

It ran:

*Well done, thou good and faithful servant.*

Then it was gone, and in a voice suddenly husky, from a throat dry and constricted with wonder, he said firmly, "We accept."

For was it his imagination, or in that brief instant had his mind been filled with a glory beside which all the stars in the galaxy were as dark dead coals?

THE END

## THE ANALYTICAL LABORATORY

With two An Lab's to report on, I'll confine the remarks to the ultimate and final remarks — the score of reader opinions!

### November 1952 Issue

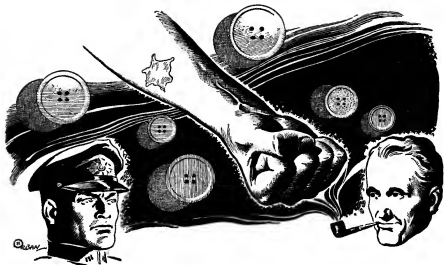
<i>Place</i>	<i>Story</i>	<i>Author</i>	<i>Points</i>
1.	Currents of Space (Pt. 2)	Isaac Asimov	1.09
2.	Pax Galactica	Ralph Williams	2.25
3.	Last Blast	Eric Frank Russell	2.91
4.	The High Purpose	Algis Budrys	3.50
5.	The Things To Come	Gene L. Henderson	3.54

### December 1952 Issue

1.	Noise Level	Raymond F. Jones	1.77
2.	The Currents of Space (Pt. 3)	Isaac Asimov	2.28
3.	The Impacted Man	Robert Sheckley	3.00
4.	Pest	Randall Garrett & Lou Tabakow	3.11
5.	Me and Flapjack and The Martians	Mack Reynolds & Fredric Brown	4.22

The general opinion on both issues might be worth presenting, too; most readers said the competition was tough in these two issues.

THE EDITOR



# BUTTON, BUTTON

BY THOMAS WILSON

*It's usually hard to clearly identify the character of another person; it's more confusing when you can't identify the character of—yourself!*

To: Theodore Fask, Earl Druze, Roland Crown  
Joint Chiefs subhead Who, Operation Hydra  
From: Leon Pearce, Investigator in charge  
Re: *Eetees on Luani*

Briefly, there were no extraterrestrials on Luani at any time. There can be no doubt whatsoever about this statement, and our fears on this score were completely groundless.

In the first place, the remote control-detection devices which originally led

us to believe that an alien ship had landed on Luani were faulty, and therefore their findings were unreliable. For details, see accompanying report of technicians who examined these instruments.

Next, my radio message stating that an eetee was at large was definitely premature, and I wish to apologize for crying "Wolf" unnecessarily. At the time, however, it seemed wiser to take no chances. The initial confusion arose from an incredible misinterpretation of facts by key participants in the events which occurred on the island. Now, however, all concerned are in substantial agreement as to what actually transpired.

At the very beginning, the investigation was complicated by a shooting which initiated a peculiar chain of circumstances . . .

The MPs hustled him from the bright building, and for a moment he could see nothing in the darkness. Blindly he stumbled. A guiding hand gripped his elbow with ungentle pressure, sending a stab of pain into his shoulder. He gasped, feebly trying to free himself.

"Sorry," the MP grunted. "Forgot about your arm."

His eyes adjusted quickly, and the dim shape of the car bulked in the star-glow. "All right, Dunlap," he was told. "In the back seat."

He obeyed docilely enough, his movements made awkward by the sling.

One of the guards slid behind the wheel, the other two crowding into the back with him, the sweaty odor of their bodies close in the hot night. The car began to roll and he moved slightly, freeing his shoulder from contact with the man on his right. Headlights were a bright whisk on Luani's coral, and the tropic breeze scrubbed away the sweaty smell of man.

Wearily the prisoner's head sagged and his eyes closed. His thinking was unclear. It bothered him. There was something he should do, a decision he was to make about these people—

*These people.* Why did he think of them as these people? He was one of them too, wasn't he?

What, he wondered vaguely, was he supposed to do? What decision was he to make? And why? Whatever it was, it was too much trouble. He was hurt and tired. Desperately he needed rest. The sad, plaintive song of that need sang in his fibers. Sleep. If he could only sleep for a little while.

The thought of the thing he must do was a persistent mosquito. Buzzing, it returned to sting him into irritated awareness. He opened his gravel-lidded eyes and asked querulously, "Where are you taking me?"

"To see a guy named Pearce." The answer was flat and disinterested.

The words meant nothing to Dunlap. "Who is Pearce?"

"Big shot, I guess, came in a copter with some Gyrenes." The MP moved his shoulders impatiently. "What's it



matter to you? Four guys saw you shoot Baker."

"I didn't —" The sudden shock of the statement halted the denial on his lips. He had shot Baker? Who was Baker? He didn't know anyone with that name. Not here on Luani, at least. And to be accused of shooting someone he didn't even know was absurd. Nervously he laughed, and the MP turned from him in disgust.

Far to the left, beyond a rise too low to be called a hill, lights from the lab painted the reaching sky. With a hint of nostalgia he watched the luminous glow. The lab was where he had worked. He, George Dunlap, had been brought to Luani to help shape the H-bomb there. His home was in Philadelphia, and he had come to this coral mote in the Pacific on a ship —

A ship. Instinctively his gaze swept to the lower sky. Stars lay there, warmly glowing jewels on the velvet of darkness, obscured now and again by the flowing shapes of fronded trees. The stars and the ship —

Why was the ship that had brought him to Luani linked in his mind with the stars? Ships sailed the seas. Ah, yes, but there were different kinds of seas, and beyond the sea he was watching lay . . . The answer was born with pain, startling him with its implication.

*Home.*

Home was the stars. A star. Home, with its warm connotations of love, of

peace, of security, of belonging. Home was Out There across the empty sea of space.

But that couldn't be. Automatically, his mind tried to reject the outrageous concept. He was George Dunlap, American, Terrestrial, *Homo sapiens*. He was born of Earth, on Earth. Home couldn't be Out There —

Or could it?

Curiously he examined the idea, a baby with a new rattle. Immediately broken, kaleidoscopic images flickered in his brain. He saw a warm beach beneath a blue sun. The sand of the beach was red, the sea saltless. He saw a house like no house on Earth, and the house was — his. He walked in a great, spacious city, the capital of a planet. Wingless planes darted in the air above, and from the people about him there exuded the confidence of a mature race, covering the city with a calm mantle of peace. The people —

He tried to backtrack and catch the thing he had sensed, but the thought twisted, eluded him and was gone.

Dunlap sat rigid and sweating. Was that home? That planet of red beach and spacious city? Was that his birth-place? If it was, what was he doing here? And why did he think of himself as George Dunlap, American?

The realization that had floated at the edge of his consciousness, unadmitted, drifted upon him, and he knew. He wasn't George Dunlap. It was as simple as that.

Then — *Who was he?*

He tensed, straining forward on the seat in an agony to know, to end this driving uncertainty.

One of the guards touched him with a firm hand. "Take it easy, Dunlap."

A thrill of pain skittered through his body and breath held too long sighed out in protest. He forced himself to lean back on the seat. "O.K.," he mumbled.

The interruption had helped. He knew that now as he felt the curled ache of his kidneys, the tight coil of his stomach. He couldn't drive his memory like a stubborn beast of burden. He must coax it, cajole it into response. The carrot, not the stick. He breathed deeply and his muscles loosened.

This decision he was supposed to make . . . It must be important. Otherwise it wouldn't bother him as it was doing, and he could rest. What could it —

An eel of a thought slicked through his mind and was gone before he could grasp it. Instinctively he knew it was the answer he sought, and he tried to recall its feel and texture.

Ready — It was something about being ready — about these people being ready. It was a feeling of aloneness and questioning.

He struggled to make sense of the scattered impressions. The decision he must make involved determining whether or not they were ready for something; and he alone could decide.

There was something else, too — a

deprivation, a negation of some sort if his decision were negative.

What could it be that these people were — or were not — ready for?

Memory gave him no quick answer.

Perhaps association would furnish a clue. The guard had said that he had shot a man. Someone else had accused him of the same thing earlier today — this morning.

Rizner. Colonel John Rizner.

Strange that he should have forgotten Rizner's calling him a murderer. His hand crept up to touch the grotesque mask of bandages covering his face. Rizner had done that to him, too. Rizner had broken his nose.

Colonel John Rizner sat at his desk that Saturday morning, untroubled by thoughts of beings from the stars who might want — almost anything.

Rizner was musing pleasantly on the cold beer and picnic sandwiches he and his girl would share that night.

Such musings were all that made the island bearable for Rizner. He didn't like Luani. He hadn't wanted to come. Europe, now — Germany, for instance — would have been more to his taste. There his rank would have entitled him to a semifeudal privilege and prestige; there catering to him and his kind was a recognized occupation among the natives.

But Luani was a far cry from the fleshpots of the world. Here even the natives had been stripped away, leaving only a hot little island isolated in

the vastness of the Pacific, tight beneath the iron lid of Top Secret. No, Operation Hydra was not an assignment Colonel Rizner would have chosen voluntarily.

Marie Dorcas understood how he felt. She didn't like Luani, either. And certain hints she had dropped had suggested that she would be glad to help him dispel the monotony. Temporarily, at least.

Rizner smiled faintly. He didn't want to get involved in anything that might become unpleasant — or permanent.

The phone shrilled. For a moment he ignored it, stubbornly trying to regather the shards of his shattered reverie. The ringing repeated, and he gave up. "Colonel Rizner, Security," he snapped briskly.

"Ellison Baker at the lab, colonel." Fear nudged the whispering words.

"Yes?"

"Listen carefully, colonel. This is Security stuff and it's got me scared." The spilling sibilants were broken by a ragged breath. "George Dunlap doesn't have that star-shaped scar on his arm any more."

Rizner's mind grappled with the implication of the words. The scar was on Dunlap's right arm, an ugly white thing with six irregular points. A scar like that didn't just vanish. And Dunlap was one of the key men in the superduper's assembly. For a terrifying instant he saw a mushrooming cloud rising over Luani, and a few of

the radioactive bits of that cloud were chemicals which had once been John Rizner . . .

"Are you sure, Baker?"

"Yes." Frightened impatience carried a convincing ring. "He just left here. We were drinking beer together, and I got a good look. The scar isn't there. He looks like Dunlap, he talks like Dunlap, but I tell you he isn't —" Silence interrupted.

"Baker," Rizner called urgently. He heard a deep breath slowly expelled.

"That matter may come up sooner than we had expected," Baker resumed, no longer whispering but speaking with ragged breathlessness.

"He came back? Dunlap?"

"Yes. And remember I'm in a hurry for those parts."

The phone hummed emptily in Rizner's ear. Catlike he flowed from his chair and into the outer office, speaking curtly as he moved. "Man the jeep." Three carbine-carrying men were up and on their way. "Tell the lab guards to get to Ellison Baker fast," Rizner called over his shoulder.

The brassy sun struck him, bouncing from the mirror of Luani's bright soil. His eyes slitted involuntarily in the glare, making his face lean and wolflike. "Lab," he rapped, vaulting into the rear of the jeep. Already sweat was a damp undergarment on his body.

The car jerked into speed. Unconsciously Rizner touched the .45 at his

hip, a savage warrior rubbing reassurance from a talisman. His eyes squinted against the wind of their passage, and other winds, colder and harsher, buffeted his brain, tossing conjecture like scattering autumn leaves.

Impatiently he touched the confusion of his mind and it grew docile, enabling him to pull information from it like clothing from a drawer. Ellison Baker, AEC man on loan to the Army. Working on tritium trigger. Not married. Parents dead. Brother missing in action in Korea. No other relatives — Rizner stopped abruptly.

*Brother missing in action in Korea.* A lever? Possibly. Pigeonhole it for future reference.

Dunlap. Another AEC man. Single, no family. A man with a scar on his arm. Could a livid scar disappear overnight? Not without plastic surgery. Not on Luani. But a man could fake a scar without actually having one. A Russian agent could fake a scar. And today he might have forgotten to fake —

The road wound to the top of a slight rise and Rizner looked down on the corrugated metal of the lab, glinting at the edge of the bluff. As always, the sight of the lab made him vaguely uncomfortable. He realized, without really understanding, the vast power contained there. He thought of the lab as Helen's home — Helen, the H-bomb. And this Helen, modern and deadly, might unleash on the world a war more terrible by far than that

loosed by her ancient namesake for the love of Paris. This Helen loved no one, least of all Man.

But she would respond in her coldly mathematical way to Man's hesitant wooing. Oh yes, Rizner was afraid she would respond, all right. And the white heat of her response might make Helen a Black Widow.

Two figures emerged from the building as Rizner watched. Baker and Dunlap? It was too far and he couldn't be sure. Where were the lab guards? Palm fronds screened his view. "Push it," he ordered the driver tersely.

The jeep slewed around a curve, leaving the palms behind, and raced across the barren flat toward the lab. The two figures were in sight again, walking with unhurrying purposefulness toward the bluff and the sun-flecked Pacific beyond.

Rizner frowned with recognition. Baker and Dunlap, all right. Baker was ahead, his arms extended stiffly from his body.

Dust was a comet's fan in the jeep's wake as the driver's heavy foot tromped the gas. "Keep Dunlap covered," Rizner shouted to the sergeant in front. "He might be armed."

The sergeant nodded, swinging a carbine halfway to his shoulder with an easy motion.

"We want him alive," grimly Rizner added, "if possible."

Baker reached the edge of the bluff, halted, and turned. Dunlap swiveled in the direction of the approaching

jeep, snapping a quick glance over his shoulder. Baker lunged forward, grabbing at the other's arm. The sound of the shot was curiously flat, a popgun of a noise.

Abruptly Baker stopped moving. Rizner saw the incredulity and pain on his face as he straightened slowly, staggered backward, and toppled toward the sea. Dunlap wheeled toward the jeep, lifting the gun in his hand. Far out on the lagoon a fish broke the surface, and Rizner felt that a fixative had been sprayed on the stream of time.

"Shoot," he shouted hoarsely.

His command was lost in the sharp sound of the carbine's voice. Dust sprang from a spot on Dunlap's right shoulder. He spun around, dropping the gun. Brakes brought the jeep to a skidding halt as Dunlap reeled, stumbled, and fell to all fours.

"Go after Baker," Rizner barked to the men.

He himself moved toward Dunlap with stiff-legged caution. The wounded man raised his head wearily as Rizner approached, watching him curiously. Rizner knelt, impatient fingers ripping the other's sleeve. "What happened to your scar?" he asked softly.

Dunlap slumped on the ground, his face white with pain, his strangely watchful eyes intent on Rizner. "What scar? What's all this about, colonel?" His voice was thick and puzzled.

Rizner laughed as though the answer pleased him in some obscure way. "I

don't know who you are," he said casually, "or what you are. But I hope you can feel this."

Deliberately he kicked the fallen man in his wounded shoulder, inscrutably watching him twist with agony. Again the foot lifted, stamping brutally into the center of the face below, and Rizner felt the satisfying crunch of cartilage beneath his heavy heel.

Yes, Dunlap thought, Rizner had broken his nose.

Later, Rizner and General Boyer had questioned him.

Dunlap's mind was a fan unfolding segment by slow segment to expose the etched map of memory. It was coming back, and he was a stranger exploring the forgotten paths of a once familiar place. They had taken him from the hospital, and Rizner and Boyer had been waiting. He had faced the two of them, his body sagging with weariness and pain.

Boyer frowned at him pompously. "What happened to your face?"

Dunlap knew that his attempt at a grin was grotesque. "The colonel can answer that better than I can, sir." His voice was muffled and nasal.

Proudly Rizner met Boyer's inquiring glance. "I broke his nose."

"Did you have to do that, colonel?"

"Yes." No "sir," no explanation. Just "Yes." Rizner would have done the same thing again.

Boyer's shrug was a disclaimer of re-

sponsibility. "Sit down, Dunlap, sit down." Impatience failed to cover an inner uneasiness in the general's tone.

Dunlap sat, gasping as his muscles turned to sudden mush.

"All right." Rizner spoke with soft menace. "You shot Baker because he discovered that you didn't have the scar on your arm any longer. Because he knew that, without the scar, you couldn't be Dunlap. That's right, isn't it?"

"Baker?" Dunlap knew he had uttered the word, but it seemed to come from a great distance. His body floundered in the waters of weakness and his brain was a lifeless bauble packed in cotton fog.

Baker? He didn't know anyone named Baker.

"Who are you? What happened to your scar?"

He was George Dunlap, of course. Scar? He had never had a scar.

"You're working for the Russians, aren't you? How did they get you in here?"

"A canoe couldn't get within fifty miles of Luani undetected," Boyer bumbled indignantly.

No, Dunlap had protested, he wasn't working for the Russians. He wasn't a traitor.

The questioning continued. "Who was your contact with the Russians? How did you get on the island? Why did you kill Baker?"

And he had honestly never heard of

Baker. Not then. This morning on the bluff, he had known he would be captured and the part he must play had to ring true. False memories had been grafted to his brain, valid patterns blocked. But he knew about Baker now.

Dunlap smiled faintly in the darkness of the car that was jouncing him toward a meeting with a man named Pearce. Yes, he knew now why he had had to do what he had done to Baker. The mental block had made him forget.

And the block was still compressing his personality. Methodically he tried to remember who he was. Strange that he should be unable to recall that. Why should his identity be lost to him?

For a moment a name hung on the fringe of his consciousness. He was about to grasp it, about to know, when it slithered mockingly away.

Dunlap, Dunlap — He wasn't Dunlap. He knew that. The Dunlap personality was a cloak of camouflage wrapped about him, but it clung with the tenacity of a straitjacket.

That planet of the blue sun, the red beach, the spacious city — *Home*.

The association was immediate in his mind. And yet when he examined it, he was vaguely dissatisfied. The true and the false seemed to swim together, blurring indiscriminately.

The house — His house. He closed his eyes and saw it. It was a beautiful thing, soaring on impossible wings in

spans of brown stone and white metal. There was a lichenous lawn of olive green, a small shaded pool, a brook babbling away.

*He couldn't get inside the house.*

He could shift to various viewpoints of the grounds outside as easily as flipping photographs in an album, but he couldn't see the interior of the building. Why not?

Again he tried to visualize the rooms inside, and got — glimpses. Tantalizing glimpses of people. There were people in the house, people about whom he felt —

*Family.*

That part he accepted. If the house were his, it was only natural that his family should be there. But if he lived there, if his loved ones lived there, why couldn't he see them? Why were they vague shadows moving in unreal rooms?

Once again he switched to the outside, and the house was as clear in line and detail as the image of his own face in a mirror.

The city, perhaps. He had felt the aura of maturity and peace emanating from the race which inhabited the city. And he had sensed something about the people there.

He could see them moving in the gracious parks, on the broad streets, in and out of the sparkling buildings. But the people were streaks, unreal blurs as in a photograph taken at too slow a speed.

Dunlap cursed softly.

The MP at his left chuckled. "S'th'matter, bub?"

"Nothing," he muttered, "nothing."

The mental block. That was causing the failure. His powers of recall were returning, but slowly. Too slowly. A blind urgency gripped him. There was some mission he must perform, a decision about the readiness of these people for — something.

Desperately he tried again. I'm leaving home, he said silently, I'm leaving home —

He was in a ship. Before him was a porthole, and beyond the porthole was — His brain reeled back from the well of inky nothingness. The port was a gigantic pit stretching to infinity, and he was falling, falling, being swallowed in its terribly empty maw. Frantically he stabbed at the solidity of the metal rim.

One of the guards was shaking him. "Dunlap!"

He realized that he had screamed and pushed out to keep from falling. His shoulder throbbed from the quick, instinctive thrust he had made with his hands.

"Guess I dropped off to sleep," he said shakily.

The guard grunted. "Nightmares yet."

He couldn't try that again. Not right away. He wasn't ready to visualize the titanic grandeur of space. He shivered as the porthole and the terror beyond flashed again on the screen of

his mind. He'd have to work through the mental block another way.

Baker. Go back to Baker —

"Time out for a beer, Ellison?"

Ellison Baker's fingers were making a delicate adjustment to a knurled knob, his eyes intent on the faint flicker of a dial's response. For a moment the question didn't seem to penetrate the cloak of his concentration. Then he glanced up, frowning. "What?"

Dunlap grinned at him. "How about a beer?"

"Yeah, sure." Baker straightened, flexing his cramped muscles in a luxuriant stretch.

Dunlap took two frosted cans from the tiny refrigerator. The opener bit through the metal with a satisfying hiss of escaping pressure, and he presented the brew to Baker with a flourish. "All the comforts of home, eh, Ell?"

"Yeah." Baker's chuckle was honed with bitterness. "All the comforts of home and the H-bomb, too. The superduper herself."

"Not letting it get you down, are you?"

"Maybe." Baker rubbed his sleeve across his face with quick nervousness. "George, I don't like it. Have you thought about this thing? Thought what it will mean when Helen blows? Really thought about it?"

"Sure." Dunlap nodded soberly. "Who hasn't?" He paused, watching Baker keenly. "Maybe she won't





blow. Maybe Helen will be a dud."

"Nuts. The thing works out. The tritium trigger is almost as foolproof as a percussion cap. You know she'll blow."

Yes, he knew. Intently he read the swift, precise symbols of the process as they spun through Baker's mind. These Terrestrials had it right, there wasn't any doubt about that.

"You feel guilty about it, Ell?" he asked gently.

Baker's face was tight. "How can you help but feel guilty when you know what it'll do?"

"If we didn't help make it, others would."

"Does that help? Does that make it right?"

Dunlap knew the infinite complexities of any answer to that question and refused the bait. "Tritium is hard to make. There are a lot of pile hours wrapped up in the little bit we have. The quantity of bombs will be limited by the amount of tritium available."

"You think you won't learn to make tritium faster?" Baker laughed, and the thin edge of bitter certainty keened in his laughter.

Yes, they would learn. They would manufacture tritium. They would make H-bombs ribbed with cobalt casings, then proton bombs. If any of them were left —

"Perhaps there won't be war," he said. "Perhaps the bombs won't be used even if we have them."

"Don't you read the papers, George?"

He saw the cynical hopelessness in Baker's mind. "We can't deal with those guys. You can't do business with a man with a gun. Oh, they'll try to bleed us white by the threat of war. They'll try to take the world over without war if they can. But once let 'em think they can win a war from us, and — Bingo!

"We won't drop the H-bomb first. But if we develop it, they'll know it can be done. They'll work it out, too. It might take a little while, but they can do it. Sure, we might have more bombs than they have, but what difference will that make? It won't take a bumper crop of those babies to do the trick. One sneak attack in real force and that'll be all for us, brother."

Yes, that would be all for them. Except that they would have time to retaliate. And that would be all, period. In his mind, Dunlap was seeing another world, a planet which didn't circle the sun called Sol. It was a world much like Earth, fair and beckoning when seen from the depths of space. But from close at hand —

They hadn't landed there. They didn't need to. They had seen all they wanted to see from their ship, floating high in the radioactive atmosphere. The blasted ruins of sprawling cities, the arid deserts which had once sprung spikes of green, the ghastly blue glow of the night side. And the lifelessness.

The lifelessness was the worst, of course. Even in their ship, death had beckoned to them, chuckling. The

hopes and dreams and toil of a civilization — gone. And it was so futile. It needn't be that way. There was no race whose ultimate, logical end was self-destruction. All that even the most warlike of peoples needed was time. Time to learn to live with their fellows. Perhaps ten years, perhaps fifty, perhaps a hundred. But time above all else. Politics had a fatal way of lagging behind technology.

And without time for it to catch up — That's all, brother.

"Suppose," Dunlap said carefully, "beings from outside, from another planet, say, came here. If they came in peace, if they gave Earth workable economic-politico-sociological formulas for peace, for living together in co-operation rather than war —"

His voice died in futility as he caught the doubt in Baker's brain. Could you, Baker's thought wondered, substitute skyscrapers for the jungle huts of savages, give them the shining city and say, "Here, it's yours. Take it and make it tick?" Wouldn't the gap be too great both in technology and concept? What would happen to cultural continuity?

*But was man no better than a savage?* Was he? Perhaps Man is more ready for the stars than you think, Ellison Baker.

"There are things you have to learn for yourself," Baker said aloud. "There are things you can't be told, can't be handed on an easy platter.

They have to grow and develop from within the race, stretching back into the past like an unbroken ribbon of road. The road will have its twistings and twinings, of course. A clan builds a strip, a state takes over the work, then a nation continues the job. And finally it is done. It is yours. But no outside contractor can be called in to pave that road. That would break its continuity, make it a dead end leading to a parrot culture."

Unless the road has progressed a certain definite distance, Ellison Baker. Then that outside contractor could help with the job. Not openly, perhaps, but with a word of advice here and there. How far has Man's road gone? That was the jackpot question.

*The call tapped gently at his brain. It was faint, as though it came from a great distance. Instantly he drove out an answering thought which was both an inquiry and an acknowledgment.*

*They intend to take action about your presence on the island.*

*How much time?*

*Present estimate — eight hours minus.*

*Has a decision been reached about my mission?*

*No. The result is too close. The margin of error is greater than the indicated direction of probability.*

*Then the decision is mine to make?*

*Yes. You will have to do it alone.*

*The answer was a heavy sadness upon him, and gently he sighed.*

*Give me the latest factor values.*

*His brain grasped the numerical di-*

*mension of each precise, abstract symbol. The values weren't cut and dried absolutes, but had plus and minus tolerances like a blueprint. It was the best that could be done. The techniques for gathering data weren't perfect. Not nearly perfect enough when the fate of a race might hang on the validity of that data. And the value of one vital symbol was missing.*

Baker drained the last of his beer and clanked the empty to the floor. "Thanks for the brew, George. And," he added wryly, "for playing father confessor."

"Sure," Dunlap replied absently. "Glad you got it off your chest."

He'd have to use Baker, he knew that. That plan was the only one available now, and the foundation for it had been laid. But to do what he would have to do to Baker —

He looked at the other for a moment, and pity was naked in his eyes.

"I'll toss this out for you, Ellison." He reached down to pick up the empty container, and the short sleeve of his shirt rode up his arm.

Soft as a windblown spore alighting on Earth, his mind went out and touched Baker's, changing the pattern of the shape that Baker saw. The change was slight, but enough.

At the door, he turned. "So long, Ell," he said gravely.

Baker's gaze shied from his. "Yeah, George. See you around."

He stopped in the hall outside, keeping his mind tuned to Baker's.

Time — He had to have a little time to get the value of the vital symbol which was missing. Without that symbol, the formulas *could* give false answers. And there was only one way to get it.

He waited until Baker had called Rizner. Then he went back into the room with a gun in his hand.

The mental message had warned Dunlap: "They intend to take action about your presence on the island."

The direction of that action would be determined by three men who sat in conference several hundred miles from Luani. The three, Theodore Fask, Earl Druze, and Roland Crown, were in charge of Operation Who, the second — and secret — head of Operation Hydra. They would decide about Man and the stars. Theirs was the responsibility for dealing with the aliens(?).

Note carefully — aliens, question mark. Aliens if there were any. There were no bodies, no artifacts which could be pointed out and branded, "This belonged to Them." And yet —

Their ships had been spotted, flitting about Earth like ghostly gnats. There was no question about the presence of the ships. And the ships had come from no earthly yards.

For Earl Druze, that closely guarded fact was more than sufficient. He knew there were extraterrestrials on Earth.

And the sureness of that knowledge lit a neon milepost on the long road

of Man's history. That was the way it should be. Man's first contact with an outside race should be a bright beacon of peace and proffered friendship. It should be something wonderful and awesome and happy, something that would lead on to — greatness, perhaps. Certainly to better things. Great things.

And just as certainly, Man's first contact with the race of the ghostly ships should not be shrouded in the childish suspicions of cloak and dagger play acting.

Crown didn't feel that way about it, of course. Crown would vote against waiting any longer. He hadn't wanted to wait this long. Druze turned to Fask and knew at a glance what the decision would be.

"Gentlemen," Fask stated matter-of-factly, "the object — which we believe to have been an alien ship — landed on Luani six days ago. Our detection devices confirm this beyond the shadow of reasonable doubt. The object — or ship — touched ground, remained approximately thirty minutes, then took off again. What its purpose was we can only surmise. We have no additional data on which to base an opinion except for the fact that the landing was not detected by General Boyer's men stationed on the island."

Fask cleared his throat pedantically. "We have seen fit to wait this long without informing Boyer of the landing, hoping that the aliens would

make their presence known to us openly and peacefully. They have failed to do this. And the question now, gentlemen, is: Can we afford to wait any longer before taking action?"

Druze flexed his long fingers absently. "We don't know what they want," he said carefully. "We haven't had time to find out — yet. But this is the first time we have been sure that one of their ships has actually landed. They may be on the verge of contacting us. If they are, should we do anything to frighten them off?"

Crown laughed, and his laughter contained the deadly sound of a machine-gun's chatter. To Druze, the man himself had the look of a weapon — stubby, compact, designed to wreak blind destruction.

"Sure," Crown said harshly, "give 'em time to sabotage Operation Hydra. Let 'em make Helen blow ahead of schedule. What does it matter if Luani and the irreplaceable personnel there get vaporized?"

His staccato laughter beat at Druze like a mocking drum.

"If their intentions were hostile," Druze answered slowly, "they would have taken action before this. They have had ample opportunity."

A smile chilled Crown's lips with contempt. "Maybe they've been waiting for this, for the H-bomb. They've always been interested in our atomic projects, our rocket testing grounds. Maybe they were leaving us alone, let-

ting us play until our play became dangerous, until we developed something we could use against them. Helen might be it."

"The men on Luani could be in peril," Fask stated quietly. "Although it is true that the aliens have taken no overt action against us, neither have they done anything to indicate that their ultimate intentions are altruistic."

"If you were a Columbus voyaging to a strange planet," Druze said softly, "and found that planet divided into two camps armed to the teeth, on the brink of war, wouldn't you hesitate as they have done? Do you think that you could expect to be received in peace?"

Crown's eyes fastened on Druze cynically. "You've got the idea, all right. But as usual your motives are cockeyed. The aliens haven't landed and made their presence known openly because we're armed. I agree with that. But if we weren't armed, if we weren't prepared" — his shrug was eloquent — "they'd be on our backs. Don't worry about that."

His body has evolved, Druze thought, and become the body of a man. But his mind is still back in the jungle. He can't conceive of a peaceful contact between races. To him, it would automatically be tooth and claw. "A people who have conquered space would have atomic engines, weapons more powerful than we have dreamed of. They wouldn't be afraid, Crown.

Not of us."

Fask coughed with a hint of impatience. "I don't believe that speculation of this sort is getting us anywhere, gentlemen. The world situation is far from ideal for the proper welcoming of interplanetary visitors, granted. Nevertheless, it is not a situation of our choosing and we are powerless to change it overnight.

"As to the weapons our visitors may or may not possess, it is extremely significant to me that the presence of their ship was not detected by the men on Luani. Doesn't that suggest a possible weapon to you, gentlemen?" His eyes rested on Druze with superior expectancy, the bright eyes of a bantam bird.

Druze sighed. He had been afraid Fask would catch on. "Mental tampering," he murmured. "After all, they had to protect themselves."

Crown guffawed. "Mandrake the Magician, eh?"

Fask frowned, crestfallen. "Yes, mental tampering of some sort. And it could be continuing. The aliens *could* have landed personnel on Luani, gentlemen."

"You think there are aliens on the island?" Crown barked. "Now?"

"I think it's entirely possible, yes."

"Then there's a mouse in our trap. I say spring it." Crown's blunt fingers opened and closed suggestively. "I'd like to get my hands on one of those aliens."

God help him if you did, Druze

thought. "I think we should wait," he said aloud. "Let's give them a little more time to make contact with us." He turned to Fask, his eyes pleading. "This may be Man's big chance to live in a better world, to resolve his problems, to reach the stars. Let's give that chance a little more time. Just a few more days."

He watched Fask's mouth set primly and knew that he had lost.

Fask tapped the ends of his fingers together with finality. "I believe that they have had ample opportunity to communicate with us openly and honorably if they intended to do so. We must protect our own position. We cannot jeopardize our men and our matériel on the basis of a hypothetical premise unsupported by fact. We cannot afford to read into the minds of the aliens either ideals or motives which we wish were there, but which may well be entirely absent."

Druze rubbed his fingers over his eyes. He was suddenly very tired. And perhaps Fask was right. They couldn't afford to gamble with the lives of their own. Perhaps he, Druze, had been too prone to regard the people of the ships as a *deus ex machina* who would do Man's dirty work for him. But things never worked out that way. There wasn't any shortcut. The road was long, and it was blood and sweat, toil and tears. And Man could only hope.

Fask turned to Crown. "The fact that the landing was not detected on Luani indicates Pearce, I think."

Crown nodded. "Yeah. Send Pearce —"

Pearce had arrived on the island in a Navy plane with a Marine escort, and his coming threw Colonel Rizner into a funk.

Rizner had expected the bigwigs to be interested in Dunlap, of course. Very interested. Since the man wasn't Dunlap, the brass would want to find out things about him. That was obvious. So Pearce's coming was, in itself, no surprise.

Rizner had regarded the interview with Pearce as a necessary nuisance which might interfere with his date with Marie. Nothing more. He had captured Dunlap. That was his job, and he had done it. Now the others could take over.

But it hadn't worked out quite that way.

Rizner and General Boyer were in the warehouse which Pearce had appropriated, and the civilian's mild blue eyes held the colonel.

"After you received the phone call from Baker this morning," Pearce said gently, "you instructed the WAC in your office to get in touch with the lab guards and have them go to Baker immediately. Is that correct, colonel?"

Rizner nodded.

"Why weren't your instructions carried out? Why did the guards permit Dunlap to get Baker out of the building?"

"Corporal Haynes, the WAC, was

unable to reach the guards by phone."

"Why?"

"The guards swear their phone didn't ring. The line was checked later, of course, and seemed in perfect order. Apparently the trouble, whatever it was, was temporary. It was just one of those things. An unfortunate accident."

Pearce frowned dubiously. "Perhaps. And Baker's body was not recovered?"

"No. The current at the base of the bluff is very strong. The body was washed away before we could recover it."

"I want to interview this man Dunlap right away," Pearce said decisively. "General, will you have him brought here, please? Under adequate guard, of course."

Reluctantly Boyer gave the order. It was obvious that the general resented Pearce.

Rizner slumped in his chair, scratching his head impatiently. Since coming to the warehouse, the inside of his skull had itched as though it were being tickled by a feather tip.

Pearce noticed the gesture. "I'm afraid scratching won't help, colonel. The black box does it."

Stupidly Rizner looked at the black box. The Marines had carried it from the plane with great care, he recalled, and now it was resting on the floor near Pearce's chair. But it seemed nothing more than a box, a black plastic case with handles on the sides and

two dials on top.

"Little gadget of mine." Pearce smiled with shy pride. "Psycho-jammer, I call it. Supposed to interfere with telepathy the way jamming does with radio. Not positive it works, of course. Telepaths are hard to find."

Rizner didn't know whether he was supposed to laugh or not. He decided against it.

Boyer did laugh, loudly and impolitely. "Which comic books do you read, Pearce?"

"I wish it were that simple, general." Pearce seemed faintly embarrassed. He cuddled the bowl of a stubby pipe in his hand as though seeking reassurance from the touch of the familiar briar. "I think you're entitled to know what I'm doing here. You see, we believe there may be an alien at large on the island. An extra-terrestrial. I was sent to Luani to catch him. Or it."

"So now we're on the lookout for Martians, eh?" Boyer chuckled scornfully.

Pearce smiled, but the smile failed to erase the grimness on his face. "Probably not Martians, general. Perhaps Venusians. Or beings from another star. But beings not of Earth."

"You're joking, of course."

"No, general. This is top secret information, but we have been sure for some time now that earth was being visited by alien ships. One of those ships landed on Luani six days ago. You should have detected that land-

ing. But you didn't. We're afraid that they — whoever they are — can read minds. Perhaps even influence thoughts."

Rizner's lips were suddenly dry. "How did you find out about the . . . landing here?"

"Remote control detection devices. We suspected the eetes would be interested in Hydra."

"And Dunlap . . . you think he — ?"

Pearce nodded. "I think Dunlap is our alien, yes."

Rizner realized that Pearce was serious. Deadly serious. He wasn't fabricating a twisted jest. Stupidly he remembered Boyer's remark when they were questioning Dunlap, that a canoe couldn't get within fifty miles of Luani without being spotted. How Dunlap must have laughed inwardly at that, and at being mistaken for a Russian spy.

It hit Rizner, then, and he felt sick.

If Dunlap were an alien . . . if Dunlap could read minds — He, Rizner, had ordered Dunlap shot, had kicked him, stomped his face with a brutal boot. And he had done those things proudly, cruelly, with the haughty scorn of a captor.

If Dunlap could read minds, he wouldn't have laughed inwardly about that.

Abruptly Rizner knew that he was the unfortunate deer who had captured the hunter, and the knowledge was blind fear within him. He couldn't

face Dunlap again. He rose from his chair and the warehouse seemed to swim about him. Dimly he heard Pearce say, "Anything wrong, colonel?"

Anything wrong? That was good. He laughed, and the sound was a whimper. He had to get out. He couldn't be trapped in this warehouse with an alien who would remember what he had done, who would look upon him as he might look upon a vicious dog.

Woodenly he began to walk. The door was a bright rectangle in the dark wall, a goal. He moved toward it numbly. He had to get out, had to get out. Ten more steps . . . seven — He watched the enlarging door with apprehensive eyes.

Then he was out, and night flowed around him. A small broken cry burst from his lips. The nightmare paralysis fell from his limbs and he ran.

The ground was hard against his flying feet and the wind was alive in his face. He ran until his lungs were searing pain and he could run no more. Then he fell and sobbed against the sand. How long he lay there he never knew. But gradually his breathing slowed, and a tiny rift of sanity cleared in the fog of his fear.

Slowly he raised himself from the hard earth, rubbing loose grains of sand from his face and from his sweat-dampened hair. He looked up at the harsh glitter of Luani's sky, filled with bright, watchful stars. Only this morning he had mused romantically about those stars, picturing them as sympa-





thetic to a colonel and his date sharing beer and picnic sandwiches on a Pacific beach. Only this morning? That time was incredibly remote, a part of another existence.

The stars weren't romantic. They were the marshaling yards of alien life, and the sky was the sea of their passage. Shivering, he closed his eyes.

Marie — He should call Marie. He couldn't keep the date, of course. But that didn't matter any more. Tonight he wasn't a lover, but a child in need of a mother to soothe away fears of the dark.

The bogey man was after him.

Hopefully he tossed the thought away. His mind was a faithful retriever, trotting after it and returning

it to his feet. Yes, Dunlap was a bogey man, all right. A bogey man he could call his own. A real bogey man from whom there was no escape in awakening. This was no dream.

Again he heard Pearce say: "I was sent here to catch an extraterrestrial . . . extraterrestrial . . . extraterrestrial —"

The words drummed within him, a hook tugging at the familiar foundations of his brain.

How could he have ever imagined Luani as isolated? The great bowl of sky pressed down upon the island, winking its myriad eyes with obscene scrutiny. And that sky had spewed an alien seed which had chosen to harbor here, invading Man's familiar shore.

"It isn't true," he muttered fiercely, "it can't be true." Man was alone. Man was the intelligent animal. He wasn't a backwoods aborigine on a dark planet surrounded, unknowing, by the teeming commerce of Others.

His denials were without conviction. Dunlap —

Desperately he wanted to fling himself prone again, to claw at the ground and burrow beneath it. Could the stars see under the ground? Could they watch him still if he drew a blanket of turf over his head?

He laughed at the thought, and the shrill sound of his voice was ice water in his face, bringing shame. It rolled over him in a thick wave, and he saw himself as he was — small and shriveled and afraid. It wasn't the fear that shamed him. He was still afraid. It was the giving way. In doing that, he had betrayed himself and his race. Man deserved to be driven from his planet if he could do no better than this.

He would have to face it. Man would have to face it. There was nowhere to run. Savagely he forced himself to his feet and began to walk toward the warehouse he had fled, glancing over his shoulder as he went, fighting down the blind surge of panic.

At least, he told himself, if there are Others, they are human. Dunlap was human. They wouldn't reduce Man to the status of a pet. He hugged the thought to him for the scant comfort it contained.

Before he reached the warehouse the siren began to wail.

Dunlap's plan was working. He had gained time. A few additional hours. Enough time to find the value of the missing symbol? He didn't know. But it had to be tried. They had to be given every chance before the decision was made.

Dunlap resented having all the responsibility for making the decision thrust upon him. Vaguely he sensed that there was a good reason why it had to be that way, but the reason itself eluded him. It wasn't easy to play god for a planet.

But the string of time was burning short. He would have to act. He couldn't take any more chances. And that meant he couldn't allow himself to be turned over to this man Pearce.

Cautiously he glanced at the guards in the dimness of the car. They had grown careless. Tangibly he sensed it. And who could blame them? After all, what could one man, unarmed and wounded, do against three armed men?

Dunlap smiled quietly to himself. How were the guards to know that he was — different?

His right arm moved in its sling and pain's quick drill tore his flesh. Ruthlessly he clamped a nerve block on the agony, and inch by inch the arm came free. He struck then, with the quick, sure speed of a serpent. The edge of his hand chopped once, twice, and the

men beside him slumped.

It wasn't quite soundless. The first man fell forward, his head thudding against the front seat, and a ragged hiss of warning escaped the other man's lips. The driver turned, and Dunlap saw startled disbelief on his face as he hit him. The car slowed and swerved, nosing blindly toward a clump of palms.

Dunlap pushed the driver aside and floundered into the front, steadying the wheel with one hand. The palms would do. He extinguished the lights and let the car glide to a halt among the trees. He dragged the three men out and stretched them gently on the ground. Exertion was torture to his wounded body and he opened his mouth so the hot breath could bypass his protesting nose.

He stood for a moment, feet planted, head thrown back, planning what he must do. And he forgot to maintain the block. Waiting wolves of pain rushed upon him ravening, and he staggered as from a physical blow. Sweat poured from him as he struggled to reassert mastery in the maelstrom of his mind. He felt consciousness flowing from him like beer from a bunghole, and he fought.

He fell. The ground sent shock through his buttocks into his spine, and the feel of the fall lingered in his shoulder laughing with exquisite pain. He swam in blackness. His eyes were open, but he saw nothing. His fingers dug without sensation into the sand

on which he sat.

Desperately he nursed the thin sliver of himself which held the narrowing crack in reality's door. Darkness whispered its siren song of rest and oblivion, and for a dangerous instant the tempting thought came: why not?

Something forced him to hang on, and grimly he held. Awareness grew. His fingers felt, his eyes saw. He sweated it out and finally the block was re-established. Shakily he stood and staggered to the car.

How much time did he have? Ten minutes? Perhaps only five. And he had over three miles to go.

He would have to risk the car. It could be spotted more easily, of course. But his exhausted body wouldn't stand a fast pace on foot. He would have to walk part of the way regardless, and the alarm would be spread quickly.

Intently he examined the map of Luani impressed on his brain. He chose his route and began to drive, following no road but going in the straightest direction possible. He used no lights, but the speedometer hovered around forty. If passengers had accompanied him, they would have remembered that ride.

The siren wailed just before he reached the bluff, and lights began to bob brightly in the distance. As he climbed from the car, blood from his shoulder was a warm puddle at his belt. He concentrated on the wound

until the flow diminished to an ooze. Then, almost reluctantly, he let the car plunge from the bluff to the sea below, listening to its breathy passage into the depths.

He began to walk. The lights were closer now. Too close. They had wasted no time baying along his trail. The cave was still several hundred yards away, and he knew he had to get there and do what must still be done. It would be close. But if he could make it, he would be safe until rendezvous —

Rendezvous —

Sudden doubt nagged him. The time and place were clear in his mind, but there was something about the rendezvous. Something he should remember. Something important. Uncertainty shook him, and he felt naked and alone.

He broke into a shambling run, forcing the doubt from his mind. He had more immediate worries. No time to feel sorry for himself now. The nerve block grew harder to hold with each jarring step, and the wolves of pain slavered —

General Boyer's fingers were clumsy animals nuzzling the papers on his desk. The papers themselves weren't important. He didn't even see them. He was seeing the black mark on his record.

The whole thing was unbelievable. Vaguely he blamed Pearce. What was the Army coming to when a civilian

— a civilian, mind you — could arrive with direct authority from the President to give orders to the commanding officer?

It wasn't Army. It wasn't Proper Procedure. And General Boyer put Army, Proper Procedure and Channels right next to the Bible. He had lived by them for many years and they had never betrayed him.

The general was scheduled for retirement soon. Operation Hydra was, in all probability, his last assignment. Then would come the orderly routine of his Connecticut farm, where semi-Spartan life would be spiced by occasional reminiscences with old cronies over a scotch and soda.

He had looked forward to the years on the farm. He was essentially a simple man. A bit unimaginative, perhaps. And his Army record was his hobby. As some men collect stamps, so the general collected memories.

Army memories. They were, to him, rich and alive, and in the leisure of his declining years he would re-examine them with pride. There was nothing of outstanding brilliance in his record, true. But it was steady and sound, and a graph of his promotions would have resembled the steps of a methodical man mounting stairs.

No black marks.

Until this. Now Dunlap's escape was a blot of India ink on the previous white. And it was incredible. How had the man done it? Three guards —

Of course, he didn't for an instant

believe that Dunlap was a Martian. Or a Venusian or anything else outlandish. Sheer poppycock.

Momentarily he toyed with the idea that the whole thing was a monstrous plot designed by subversives to undermine the prestige of the Army. But he had checked on Pearce. The higher-ups were behind him, and they were deadly serious about this business.

Suddenly Boyer felt old. Elasticity had dried within him to a brittle gum. When he entered the Army the cavalry rode horses and planes were still flying machines, dinky and impractical. He had adjusted to the tank, the paratrooper, the transcontinental bomber, the A-bomb, the jet. But this nonsense about men from the stars and telepathy was too much.

He refused to credit the reality of such things. And when his superiors began to take absurdities of that kind seriously, it was time for him to step down. He would get out before the Army went completely insane.

In a way it was funny. He saw his record and the Army — the two were inseparable, of course — turned topsyturvy by a scooting object which didn't exist. A flying saucer.

It was a joke. That was the only way to treat it, as a joke. And jokes were something to laugh at. Obediently a sound came from his lips. The ring of the sound was hollow.

No, it wasn't funny. His vision blurred with sudden mist and he blinked. For a moment he sat very

still and erect, watching a parade of vanishing ghosts. Then he sighed and set to work, sorting the papers methodically. His successor would need this — And this —

Two slow tears glistened on the leather of his cheeks, and the lump was large in his throat.

Searchlights were bright fingers picking delicately over the landscape for the fugitive. Among the fingers moved dark hunters, linked by sharp voices in a nervous network of sound.

Dunlap fell heavily as one of the bright brooms swept toward him over the sand. He clung to the earth until it passed, then rose and ran in the valley of shadow. Run, fall, and wait. But there was a limit. Flesh and blood could only take so much.

Run, fall, and wait. A little closer to the goal. The block a little harder to hold.

Run, fall, and wait. Liquid fingers were knitting a warm sweater of blood for his shoulder.

Prying lights crept closer, voices grew louder. "There. What's that?" A shout clear and near.

Dunlap froze. Slowly he turned his head. The searchers were within fifty yards, and one of them was pointing with his light. He would have to get rid of them.

The web of his mind reached out soft as thistledown, seeking contact. Just a touch of control to distract their attention.

*Nothing happened.*

The web drifted out emptily, touching nothing. What was wrong? Desperately he worked with the web, casting it again and again. What had happened to him? He couldn't make contact. He couldn't control the men moving toward him.

Bitterly he watched the lights and listened to the voices, knowing he was beaten. Why couldn't he make contact with their minds? To get so close —

A sound that was half curse, half snarl rose in his throat.

A distant shout came, urgent, summoning. The hunters paused, babbling together, then raced away toward the summons.

The snarl left his body as a sigh. He was safe. Temporarily, at least. But it was not a safety of his making. Painfully he forced his muscles to hurry, knowing now the full extent of his helplessness.

Along the edge of the bluff he moved, seeking the tiny ladder of pegs. And the bright fingers picked over the sand seeking him.

Fask clasped his hands behind his back and rocked on his heels in his schoolmasterish way. "Well, gentlemen?" The question was purely rhetorical. "You heard Pearce's radio message. He believes that there is an alien on Luani. An alien and a murderer. And he has escaped. He is at large on an island with the greatest destructive weapon known to man."

Druze frowned. "It doesn't fit. It's too clumsy. Something about it smells."

Crown laughed sardonically. "If you've finally got a whiff of it, it must stink to high heaven."

"No," Druze said softly, hiding the anger within him, "that isn't what I meant. The situation isn't logical. Not unless they're testing us. It doesn't make sense any other way. They've set up a pattern to get our reaction, the same way we put rats in a maze. We've got to make them realize that we understand —"

"Druze," Crown interrupted savagely, "what does it take to convince you? Pearce told us that that thing has already killed one man. There's a rat in this all right, but not in a maze. The rat is on Luani in our trap." He turned to Fask, flushed with the excitement of the chase. "We've got to make sure we get that thing, that alien, Fask. This calls for Red Ralph."

"I agree." Fask flipped a switch and spoke. "Red Ralph into effect immediately," he said.

Druze sighed impotently. Red Ralph meant a destroyer-submarine cordon, a plane umbrella, and Marines. He hoped the aliens were a tolerant race who wouldn't expect too much.

Dunlap pushed aside the covering and swung his body into the tiny opening in the sheer face of the bluff. It was a tight fit and he wriggled. Before he drew his head in, he glanced

up. No black gargoyles protruded from the silhouette of the lip above him, no hunters looked down. He had made it.

He refastened the covering and stood erect in darkness. Fumbling, he found the flash. Its glow revealed a cave, but not a natural one. It was small, with smooth, hard walls, and its shape was oval. There was equipment in the cave.

Dazedly Dunlap looked about, not quite knowing what to do. Blood and sweat crusted his flesh and weariness was a sodden garment he had worn too long. He was a hunted animal, hurt and tired, who, reaching the safety of its den, finds that is not enough.

His wounds. He must lick his wounds. There was medicine in a small chest. Trembling fingers stripped away shirt, removed bandages, did what was necessary. There was food; he ate, and strength which had guttered dimly began to burn with a small, sure flame.

Sleep. He must sleep and then make the decision.

Gingerly he released the nerve block. The medicine had been busy. His wounds were healing and the pain was bearable. He extinguished the light and stretched out on the floor. Immediately a feeling of wrongness, of out-of-placeness surged over him. He was a stranger half awakening in the dark to discover unfamiliarity about him.

Deliberately he thrust the feeling aside. Setting a mental alarm to rouse

him in an hour, he snuggled into the soft covers of rest and oblivion. The last sound he heard was the distant drone of planes.

He awakened and was instantly alert. Many planes were roaring overhead now, a drove of noisy vultures. Dunlap lay in the darkness listening to the whooshing blast of the jets, not greatly disturbed by the sound. Tentatively he moved his arms, his legs. The returning strength of his body bathed him in a warm, animal-like glow.

He arose, stretched, and ate ravenously. His watch told him that a scant two hours remained before rendezvous, and his decision was yet to be made. It was time to get to work. In those two hours he must decide, make whatever preparations his decision required, and be ready to leave.

But first, there were several things he must get straight.

*Who was he?*

Quickly he peered into the rooms of his mind. Access to them seemed free. Apparently the mental block was gone. Then — who was he? The name that suggested itself was — George Dunlap.

Angrily he slapped the name aside. He wasn't Dunlap.

Urgently he riffled the file of memory, and for an instant he glimpsed what he sought, dark and sealed. *His identity.* He tore at its wrapping, eager to see the familiar but forgotten thing inside. It squirted away like an orange

pip and was gone.

He shifted his attack. His companions on the ship flaring through space, his family inside the house of soaring wings —

*Why couldn't he see them? Why were they nameless?*

Clattering through the corridors of his mind he raced, desperately searching for a familiar face, a name of wife or child or friend. Tantalizingly they eluded him, playing a flirting game of hide and seek. They were ghosts mocking him with his inability to catch them; ghosts who made no effort to disguise their presence but vanished, laughing, before he could clothe them with the flesh of reality.

Sweating, he forced himself to abandon the useless chase.

What was the reason? Why was his identity, the identity of others of his race, hidden from him? So he would be unable to reveal them if captured? But that made no sense. He had been captured already.

Obviously the mental block was still partially effective.

But why should his identity be denied him when he could recall his house, the red beach and the saltless sea, the ship and the stars?

*Because, for the time being, those things didn't matter.* For an instant he sensed the thing that did matter, the thing that the people of this planet must not know. He mind reeled from the shock of that knowledge as from a live wire, and he forgot.

Something nudged his thoughts; turning them from introspective channels. The decision —

Prime question: Is Man ready for the stars?

He smiled as he recalled Baker's negative answer. Baker would have been surprised to discover how close the decision really was.

He broke out his tools, the formulas which would furnish the answer, and slid values into the symbol slots. Some values he shifted to the high limit, some to the low, reversing, juggling, his brain busy.

And, as he had known all along, there wasn't any answer. Not without a value for the vital, missing symbol. Without that, the margin of error inherent in the factor data was greater than the probability direction indicated by the result.

But it was close. Very close.

A race had to get so far under its own steam before it was ready for Contact. If it didn't, it lost its identity. Its native culture withered, died, and was replaced by the meaningless mirror of an alien growth. But if a race were mature enough, if its roots went deep enough, then it would bloom under the strong fertilizer of Contact.

But the distance a race must reach by itself was not a point, but an area; an area shaded in doubt. Before that area was gained, Contact caused regression. Beyond that area, progress. But within that area — Who could tell?



And, in so far as he could determine from the available data, Man was within the area of doubt, the region of danger. Contact with Man now was uncertainty, a gamble. It might soar him to the roof of the galaxy. And it might rob him of his heritage, make him an Indian on a reservation.

But there was danger, too, in failing to make Contact. Man bristled with belligerence. He might destroy himself before he emerged from the area of doubt. That was the rub.

*Learn, Man, to live with your fellows.*

Dunlap shook his head. How could he decide intelligently?

Restlessly he began to pace the cave. At the far end of the oval space squatted a black machine, sleek and soundless as an obedient pet. He visualized the motor within that machine, more powerful by far than any yet devised upon this planet.

Was that machine the answer he sought?

It might come to that. But not yet. There were subsidiary formulas he could try, alternatives which might throw additional light upon the problem. He became absorbed in the working factors, and was still for long minutes.

They weren't conclusive. Political structure, political growth, rate of progress toward stability — Technology, inventiveness, cultural patterns, cyclic swings — The long, tortuous road of History, with its horseshoe bends, its descents into deepening val-

leys, the sudden, breathtaking climbs —

All these things he considered, equated, and evaluated. And they weren't enough. He needed the missing symbol which represented motivation and characteristic, basic drive, the idiosyncratic twist of race.

And suddenly he realized that he had it. He had a value for the vital symbol. He had had it all along without knowing. Briefly he wondered if that was why he had to be the one to make the decision.

Eagerly he made the transformations, hoping with all his being that Man was ready, that the answer would prove his readiness. The symbol of the result flared in his brain, and he regarded it as he might a scorpion.

"Warlike," the result shouted. "Handle with care. Dangerous. Explosive. Do not open."

Dejectedly Dunlap sat upon the floor of the cave, his finger tracing a meaningless design in the invisible dust. He might have known.

The breaking of his nose, the scornful, insistent questions they had barked at him, the terror of their ruthless pursuit as he fled — The armada of planes roaring overhead, Helen and the radioactive sisters which would follow her —

All of those things were a part of the answer. And all of them shouted; "Warlike, warlike —"

Yes, he should have known

His decision was clear. Wearily he rose and walked to the black machine.

The suppressor was the only answer.

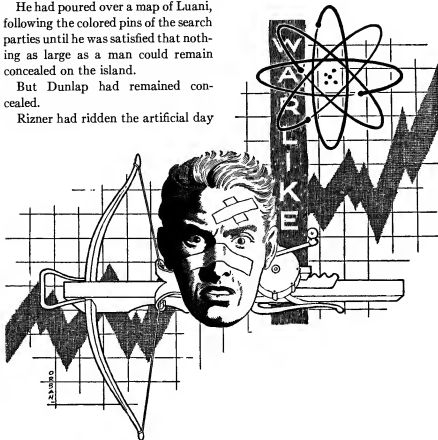
To Colonel Rizner those hours were unreal. Gradually the red coals of his fear were banked by the routine activities of the search, and the search itself became a game, a maneuver through which he could move without thought. He couldn't let himself think. Thinking about it would be a fresh draft fanning the banked fear flaming.

He had poured over a map of Luani, following the colored pins of the search parties until he was satisfied that nothing as large as a man could remain concealed on the island.

But Dunlap had remained concealed.

Rizner had ridden the artificial day

of Luani in a jeep, maintaining contact with headquarters by walkie-talkie. He had heard the swoop and whine of the planes overhead, had seen the brightly blooming flowers of their flares. He had watched the lights of the ships offshore winking at the island with fantastic coquetry, had encountered the hunters swarming like ants.



And Dunlap was still hidden. Somewhere.

On the island? To Rizner that seemed impossible. And yet, it seemed equally impossible that he could have escaped it.

It wasn't real. It couldn't be real. All these planes, all these ships, these men, armed to the teeth to ferret out and attack — What? One man? One something? It was ridiculous. And frightening.

One something from Out Yonder. One mariner washed to familiar shores by an unfamiliar sea. He glanced at the dusky pall of sky, hazed by lights beating up from the island, and was glad that the alien stars were blotted out.

Toward dawn the colonel left his jeep near the lab and walked along the bluff brooding over the leaden ocean. He was tired and he moved with slow purposelessness, smelling the good salt of the sea. Then he saw the figure.

It was huddled in a small depression not far from the bluff's edge. Just sitting there. No, Rizner told himself, it can't be. But something made his scalp prickle and fear flared within him. He trembled, half turning as though to flee, then stopped, ashamed. Like a cornered savage calling upon his gods to exercise their power through a talismanic charm, he drew his .45. Forward he moved on the balls of his feet, his finger itching at the trigger.

Dunlap knew now that they weren't

coming. His hand moved uncertainly toward the vernier dial of the tau wave, hesitated, and drew back. There was no point in trying again. He had been trying to reach them for the past two hours, ever since they failed to keep the appointed rendezvous, without success.

Not again would he see the ship and his faceless companions, nor his house and nameless loved ones. Gradually he realized that they had never intended to come. His mission was not completed.

Wearily he moved about the cave doing the things he must do before he left it for the last time. Check the dials of the black machine, pile the equipment around it. Briefly, loneliness and rebellion struggled with his sense of duty. It wasn't much of a struggle. He really had no choice, he knew that. But it was bitter.

Farewell, you whom I love but cannot recall. Farewell, beloved memories unremembered. Farewell, planet of the bright blue sun; farewell, home —

He stood at the cave's exit and looked back at his work, wanting to linger a few precious minutes more in this place which linked him to — somewhere. And he knew he could not. Dawn was pallid in the east, calling upon him to leave.

The switch of the flame gun moved beneath his finger. He played the beam like the stream of a garden hose, and its touch made the walls melt and flow. Soon the black machine and the

pile of equipment were encysted. He lifted his hand in grave salute, then quickly eeled through the opening to the outside.

He sealed the cave with the gun, did something to the switch, and threw it into the ocean below. In a moment angry bubbles broke the surface, and he knew that beneath the bubbles lay a fused twist of metal.

Slowly he climbed, kicking loose the pegs as he went. And as he ascended his mind began to close, folding in upon itself like the wedges of a Japanese fan.

This was the hardest part of all, he thought before it became too late for him to think about it. This compression of his personality, feeling his ego being encysted like the machine in the cave below, was the hardest to bear; harder even than desertion by his companions.

He crawled over the lip of the bluff. For a moment he sat, wondering why this sense of sadness was upon him. Idly he plucked a peg from the face of the rock and tossed it into the water.

What was he doing here? There was something — He gazed up at the palming stars as though hoping to read the answer in their twinkling eyes. But he did not.

It didn't matter. Aimlessly he began to walk. He reached a slight depression in the sand and sat down to wait.

Rizner found him there.

"The prisoner is human," Pearce

said slowly. "One hundred per cent human."

The band constricting Rizner's chest burst and he breathed in deep relief. "Thank God," he muttered softly.

"Knew that all the time," Boyer remarked querulously. "Of course he's human. Has to be." The general seemed suddenly old and childish.

Pearce sucked his gurgling pipe thoughtfully. "There are several oddities about the prisoner, however. First, his wounds have healed with miraculous swiftness. Second, he seems convinced that he has worked out a revolutionary approach to politico-economic theory and he says he intends to write a book about it. Third, he is suffering from a partial amnesia. He doesn't know who he is, and the events of the past week are a complete blank to him."

"He's lying," Rizner said without conviction.

Pearce shook his head. "No. We used the polygraph and scopolamine. He isn't lying." Absently he twisted the pipe in his fingers. "Colonel, about that scar on Dunlap's arm: When Baker phoned you from the lab to tell you that the scar had vanished, why was your reaction so vivid and immediate?"

Rizner frowned. "The scar was such an obvious thing. I knew it couldn't just disappear."

"You knew Dunlap couldn't be Dunlap if the scar had vanished. Is that it?"

"Yes, I suppose so."

"And yet you persist in calling the prisoner Dunlap. Why, colonel?"

"What else is there to call him? Mr. Alien?"

Pearce nodded understandingly. "Did Dunlap ever deliberately attract your attention to his scar?"

"Why, he showed it to me in my office one day. Laughed about it. Said everyone should have some such identifying characteristic."

"And you, general?"

Boyer nodded absently. "Showed me his scar at the lab several days ago, made some joke about radiation burns."

"I see. Colonel, will you describe Ellison Baker for me?"

"Washed out blondish; medium size. The sort you wouldn't look at twice."

"Of course," Pearce murmured. "He would be." He stared at Rizner intently. "Colonel, you're a trained observer. Don't you see the significance of what you've just told me?"

Rizner sat very still, moving the pieces in his mind. The thought that began to form was an icicle. "No," he said. "No."

"Yes. The prisoner — the man you call Dunlap — is Ellison Baker. There is no Dunlap. No one named Dunlap has ever been connected with Hydra."

"Ridiculous," Boyer mumbled petulantly.

"I'm afraid it isn't, general. The prisoner is Ellison Baker beyond the shadow of a doubt."

Frantically Rizner jerked open the drawers of his mind, seeking denial and finding none.

"The pigeonholes of personality were switched," Pearce continued. "The real Baker was given another name: 'Dunlap.' The name that remained, Baker, was . . . appropriated. Baker himself was manipulated, of course, as 'Dunlap.' He was a pawn on the board."

"Then the man who was murdered on the bluff —?"

"Was the alien. Of course, he wasn't murdered."

"A fish jumped," Rizner said slowly. "When Dunlap — the prisoner — fired, a fish jumped in the lagoon." He looked at Pearce, and fear peered from his eyes. "But it wasn't a fish, was it?"

"No, colonel. I'm afraid the 'fish' was the bullet you thought killed Ellison Baker."

"Nonsense," Boyer snorted. "Nonsense."

"I don't know when the switch was made," Pearce said, ignoring the general. "Possibly a week ago, possibly yesterday on the bluff. You were conditioned, of course, colonel. You and the others here on the island. You were conditioned to accept the substitution. Baker — the man we have captured — kept us busy while the eetes did what they wanted to do."

"But what were they after?" Rizner might have been speaking to himself. "The bomb wasn't touched. What

were they after?"

Pearce gnawed his pipe reflectively. "Certainly they wanted to reclaim the . . . one of them who had been Baker, the one who took over Baker's identity temporarily. Other than that . . . who knows? Several hypotheses are reasonable, I think. Let's assume, for the sake of argument, that the aliens are benevolent. These politico-economic theories Baker has picked up from . . . somewhere, sound pretty good to me. Suppose the eetees gave those ideas to Baker so he could pass them on to us. To keep Man from blowing himself up, say.

"Or perhaps they just wanted to get acquainted with us. Perhaps they wanted us to believe that we had captured one of them to see what we'd do." He paused to relight his pipe. "We've been playing a game of Button, Button, Who's Got the Button. And so far we haven't located the button."

It would be a hard fact to live with, Rizner thought, knowing there were Others. It stripped away something from Man's essential conceit and made him small. But there *was* that one consoling fact —

"They're human," he said. "At least, they're human."

Pearce looked at him pityingly. "Are they, colonel? Are they? Remember, they conditioned you."

"But Baker," Rizner stammered. "The one of them we thought was Baker — He was —" His voice trailed

into silence as his mind twisted and reeled. For a moment he thought he had the answer, an answer as cold and hard as a button, and he opened his mouth to scream. Then the answer slipped away.

*There was something that the people of Earth must not know.*

Rizner shook his head dazedly and found Pearce staring at him with a puzzled expression. They had both forgotten.

*Report of Leon Pearce, Investigator in charge, to Joint Chiefs, subhead Who, Operation Hydra.*

It is evident, therefore, that Ellison Baker, driven by a sense of guilt about his work on the H-bomb, escaped, in his own mind, into the fictitious personality of "George Dunlap." As Dunlap, he attempted to expiate his guilt by "killing" Baker — himself. Obviously, this was an elaborate effort on his part to wipe from memory the man he had been, the man who was a symbol of contribution to a project which might result in mankind's destruction.

Accordingly he proceeded to act out a pantomime of the "murder" on the bluff near the lab. This he did so realistically that Colonel Rizner was deceived into believing that a murder had, in fact, been committed. Previously Baker had laid the groundwork for this scheme by telling Rizner on the phone that "Dunlap" was not "Dunlap," but a spy, and that the spy was planning to kill him, Baker.

This action would seem to indicate that, subconsciously, Baker rejected the fraud which he was about to perpetrate on Rizner and hit upon this method of insuring his own punishment for his "crime" toward humanity by making himself appear guilty of his own murder.

After his capture, while submerged in the "Dunlap" personality, Baker steadfastly denied that any such person as Baker had ever existed. This apparent inconsistency is, of course, merely further proof of his desperate desire to remove all trace of his former self.

In Rizner's defense, it must be stated that Baker had recently arrived on Luani; and that, because of a mixup in the States, his dossier had become confused with that of another Ellison Baker employed at Hanford.

While being brought to me for interrogation, Baker managed to escape his guards, remaining at large overnight. There is some evidence indicating that, during this period, Baker believed himself to be an alien from another world. If he did wander into such a mental fantasy, it is only additional proof of an attempt on his part to escape the unbearable reality of his work on the bomb.

Since his recapture, Baker has made the return to his own personality. Proper treatment and rest should result in his complete recovery. Naturally, he is being released by the AEC.

Scheduled preparations for testing

the H-bomb are proceeding according to plan.

Ellison Baker wasn't interested in the truth or falseness of Leon Pearce's top-secret report, now, after several months, gathering secret dust in a secret file.

Ellison Baker was happy. He was hard at work on his book, and he had found a publisher who was enthusiastic about the new politico-economic formulas set forth and developed therein.

Baker had always felt, as had the great majority of all men of all ages, that there should be some relatively simple, workable solution to the age-old problem of Man's living with his fellows in peace and plenty without the blind insanity of wars and the creeping paralysis of political corruption or overweening bureaucracy. He would have been the last man on earth to claim that his formulas furnished all the answers. But he was convinced that the approach to that problem suggested by his formulas would put Man's faltering foot firmly on the right rung of the right ladder.

Ideas, of course, are slow tools. But they are sure ones. It takes time for the thinking of the Hobbes, the Lockes, and the Jeffersons to become martial music sounding the clarion call that all men are born free and equal; that all government derives its authority from the just consent of the governed. The next step, too, would take time. The new concepts

must spread, and men must worry the meat from their bones and chew them.

But the fusion suppressor in the cave on Luani would grant time. Some time, at least —

And sometimes, when Baker grew momentarily discouraged, he would recall vaguely as in a dream the happenings on Luani. And it seemed, curiously, that once upon a far away time when he had been drinking beer with a — well, not exactly a man, but a friend — that the friend had come to him with a gun in his hand. A gun extended butt foremost. And for a time thereafter, he, Baker, had exchanged places with the friend and had looked at Man and his world through different eyes. He felt that the friend had helped him make a decision about — something. Something important. As a wise old contractor, for instance, might give a fledgling at the game a word of advice. And, somehow, his new formulas had grown out of that experience.

Leon Pearce had said that they were playing a game of Button, Button. Consciously, Ellison Baker would have denied that he could be the possessor of the button Pearce sought. But Baker knew that a button was a tool which, properly used, would help fasten and sustain the dangerously slipping garment of Man's civilization.

THE END

BUTTON, BUTTON



## MOVING?

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# FIVE BILLION DOLLAR MAGPIE

BY WALLACE WEST

*The scrap and salvage business is necessarily an ever-growing business. The more total goods the nation has, the more material must be recirculated as scrap. Ores alone cannot supply our needs—and the second most important metal mines are the salvage yards!*

The scrap, or waste materials, industry may well have had its origin when the Israelites wandering in the desert brought their golden earrings to Aaron "And he . . . fashioned it with a graving tool, after he had made it a molten calf." It is likely to be the collection agency for old swords if, and when, folks get around to beating such weapons into plowshares. In the meantime, the salvage and reclaiming of waste materials, from cold rolled steel to corncobs, has become one of America's key industries. It does a five billion dollar annual business involving a quarter million collectors, auto wreckers and peddlers, some twenty thousand dealers and approximately two hundred thousand

highly-skilled employees. Without it, hardly a tree would be left standing in our forests and many of our newest plastics, chemicals and medicines would still be in the test-tube stage. Yet the growth of this industrial magpie has been so unattended by fanfare that it is not even mentioned in several leading encyclopedias.

The impression most people have of the waste materials business dates from childhood memories of old men in decrepit wagons piled high with paper, rags and tottering cook stoves. Usually the horse wore a tinkling bell around its scrawny neck and the driver, as he passed slowly through residential streets and alleys, chanted some such doggerel as:

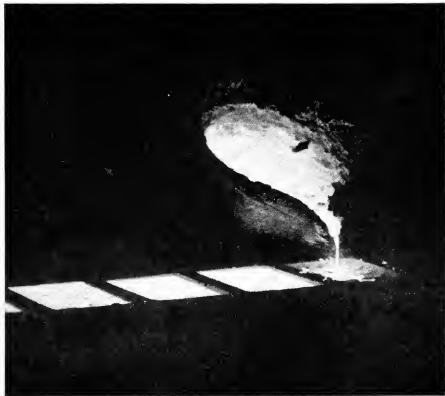


Photo by Norton

Most of us think of metals coming from rocky ores—but the salvage yards are a national resource of the first magnitude. Stoves and automobiles may wear out; their atoms never do.

*"Any rags, any brass, any bottles today?  
The same old song in the same old  
way."*

It is true that many successful waste dealers got their start in this prosaic fashion around the turn of the century. Hundreds who have made names for themselves in one of the few remaining

American industries dominated by small business men began their careers by bartering kitchen utensils to housewives for the broken or worn-out contents of barns and attics. The rag man is still in evidence in rural communities and even in cities during periods of hard times, but the average dealer has become a specialist. In the scrap-iron

field, for example, he usually operates a well-equipped yard employing from five to forty-five people. He owns cranes, magnets and grapples for lifting the metal, electrically-driven batteries of shears and hydraulic presses costing up to seventy-five thousand dollars. The most modern yards boast "skull-crackers"; heavy balls dropped by magnets from tall derricks to break up cast iron. They use acetylene or argon torches to cut newer varieties of steel that are too tough to be handled by shears.

The dealers are represented by two nation-wide trade associations: The Institute of Scrap Iron and Steel with headquarters in Washington and the National Association of Waste Materials Dealers, Inc. headquartered in New York. The latter, in turn, includes specialized trade groups such as the Cotton Rag Council, Metal Dealers Division, Scrap Iron Division, Scrap Rubber Institute, Secondary Metal Institute, Textile Fibres Institute, Waste Paper Institute and Wool Stock Institute.

The National Association was organized in Boston in 1913 for the primary purpose of drawing up specifications for waste materials that would end the chaos that had attended the mushroom growth of the industry. At that time "No. 1 White Shirt Cuttings" in the Boston market might be "No. 2" or "No. 3" in New York and trading was as mad and heartbreaking as the operation of America's railroads had

been prior to the adoption of Standard Time scheduling.

Since its organization the National Association has developed rigid specifications for all types of waste. There are, for example, ninety-seven different kinds of cotton rags, not including six grades of old mattresses; twenty-seven types of rubber; ninety-five grades of non-ferrous metals, each with a fancy code word such as "Candy" for heavy copper, "Pagan" for high grade-low lead bronze solids and "Flirt" for clean nickel peelings and strippings.

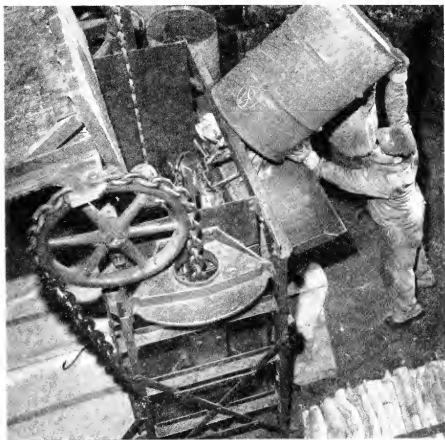
Wool rag classifications are relatively few—only a dozen are listed—but there are forty-two wastepaper standards, including such intriguing items as "No. 1 Flyleaf Shavings" and "Super Hard White Envelope Cuttings." The latter consists of "baled cuttings or sheets of white envelope papers of reasonably uniform brightness, free of printing, groundwood and soft stocks, in which outthrows may not exceed one half of one per cent."

Specifications of this type are absolutely necessary because of the highly specialized nature of products in which waste is incorporated. They explain why pickers, sorters and other persons employed by dealers must be highly skilled—any shipment containing contaminants or improper grades of material bounces straight back from processor to dealer and often represents a dead loss.

Another dealer headache comes from

the fact that, except in wartime, he operates in a buyer's market. All things being equal, a processor prefers to use new raw materials. With the exception of the manufacturers of glass and a few other products, old

materials are acceptable mainly because they are cheaper than new ones. As a result, scrap prices fluctuate widely and wildly from week to week and sometimes from day to day, according to the stern law of supply and



The Port of New York Authority

Handling the rocky ores is, in some respects, easier than handling the sort of ores the scrap dealer works with. It takes big-industry equipment to do it.



The Port of New York Authority

About fifty per cent of the nation's steel production comes from scrap, not ore. Naturally, the steel-scrap business involves the greatest tonnage, and the heaviest handling equipment.

demand. Only in the ferrous metals field are long-term supply contracts written. And even there, "long-term" means no more than a month in advance. A dealer caught with a big inventory usually has inadequate storage facilities. He can't wait for the price to improve so he sweats, curses fate and sells for what the most interested buyer he can locate will deign to offer. As a result, the industry has an extremely rapid turnover.

When a shortage develops, however, the picture changes almost instantly.

The price of a particular variety of waste may shoot skyhigh because there is no inventory from which to fill the demand. This situation helps to explain the sudden frantic searches for such things as tin cans, used fats and old tires that were organized and publicized through every known channel by government agencies during the recent war.

The growing shortage in this country of new raw materials of almost all types indicates that the waste mate-

rials industry is still in its infancy. A recent report by the President's Materials Policy Commission warns that the growth of the United States may actually be halted within a comparatively few decades unless Americans learn to conserve not only their oil, lumber, soil and mineral resources but every "scrap of scrap." The time is at hand, the Committee indicates, when we can no longer afford to commit such follies as dumping four million tons of tin cans each year with a consequent loss of some two million

tons of scrap iron and twelve thousand tons of tin. In fact, our present squabble with the Bolivian government over the nationalization of its rich tin mines may well be the forerunner of another appeal to American housewives to save empty cans until the junk man or the Boy Scouts come around to collect them.

In this connection, a recent comment by Arthur C. Bunce, assistant professor of agricultural economics at Iowa State College, is pertinent. In his book, "Economics of Soil Conserva-



Sheep eat grass, and by an elaborate biochemical transformation, produce wool. This machine eats woolen rags, tailor's cuttings and the like—and produces wool fibers, too.

tion," Professor Bunce points out that Theodore Roosevelt's efforts to launch a conservation movement back in 1908 collapsed because conservation was economically and politically ridiculous at that period in this country's development.

The writer shows that a nation rich in raw materials cannot *force* its citizens to conserve those materials for use by future generations. Exploitation of resources is unavoidable under such circumstances. If a farmer ruins his land, there is always more to be had "out West." If forests are denuded, they can be planted in wheat.

Comes the time, however—the era the United States is now entering—when natural resources no longer are boundless. It becomes sound economic policy to conserve them for the very simple reason that it is cheaper to spend money for fertilizer than to abandon the field and go looking for virgin land that no longer exists.

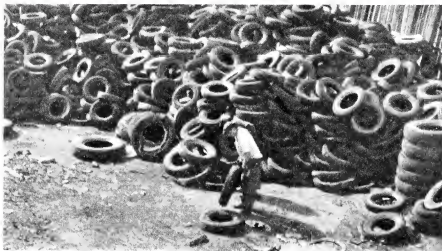
The final step comes, of course, when it becomes economic not only to *conserve* a resource in order to get the best use out of what remains available but to endeavor to *improve* that resource. Synthesis of liquid fuels from relatively abundant coal instead of from relatively scarce petroleum; the rebuilding of eroded top soil or the development of sun-power projects could be examples of such improvement. It will come on a large scale, says the hardboiled Iowa professor, only when it pays the capitalist-producer, in ac-

tual dollars and cents, to improve, or at least to conserve the resources he works with. Any other way of looking at the problem, he contends, is moralistic moonshine.

It is interesting to note that, from the very beginning, the waste materials men have been aligned with the conservationists. Spurred on by the profit motive, working without government subsidy and often in the face of ridicule, they have developed techniques for salvaging the most diverse and even the most seemingly outlandish products. They have co-operated wholeheartedly with other industries and with government agencies in finding ways of reusing those products or turning them into completely new items of commerce.

As a result of this attitude, a number of new industries have been born. Many articles using scrap in their manufacture are actually better than those made of all new materials. Several key businesses now use more waste than they do primary stock. Others, like the building-board makers, flourish almost entirely on waste. Vast quantities of lumber, oil, ore and other resources have been saved for use in the future. And research is continuing with a view to keeping our economy healthy and expanding long after the time when the recovery curves for virgin raw materials will have started to decline.

There is no room in an article of this length for a description of all the



Atoms never wear out; molecules take a beating in being rearranged into a special product. Old tires, though, supply rubber that's first-rate for floor mats and hard rubber articles, and the like, however.

techniques used in the collection, handling and processing of the thirty-three main types of wastes. Those interested in such a discussion will find it in a book entitled "Industrial Wastes, Their Conservation and Utilization" written by Charles H. Lipsett and published in 1951 by the Atlas Publishing Co., Inc., of New York. A few high spots will be mentioned here to show the scope and vital importance of the work and the amazing ingenuity being used to turn what appears to be worthless, even noxious, remnants into valuable products without which our economy would falter and come to an abrupt standstill.

### Ferrous Metals

When the average person thinks of

scrap, he thinks in terms of iron and steel. This is oversimplification, since the non-ferrous metals that are re-processed play equally important roles in the nation's economic life. It is true, however, that collection, sorting, preparation and delivery to consumers of iron and steel scrap is big business, one that includes about half the value of all waste materials handled in the United States. About seven hundred fifty million dollars worth of scrap iron was sold in 1949, while in 1948 the total hit a billion and a quarter dollars.

Steel mills now mix new pig iron and scrap on a fifty-fifty basis. It takes two tons of ore, one ton of coal and about three-quarters of a ton of limestone and other raw materials to make one ton of pig iron. Obviously the



substitution of a ton of scrap for one of those tons of ore goes a long way toward the conservation of our natural resources. And this substitution starts an endless chain. The scrap, whether obtained from a toy or a battleship, never is wholly lost.

This factor has made scrap of steadily increasing importance through the years. In 1900 about five million tons were consumed in this country as compared with almost twenty million tons

of pig iron. The balance was reversed for the first time in 1943 when fifty-five million tons of scrap were melted and forty-nine point four million tons of pig iron were consumed. The scrap percentage has continued to climb since that date.

About forty-one per cent of scrap iron comes from industrial sources; sixteen per cent from railroads and forty-three per cent from collectors. Automobile wreckers sell largely to the



Quaker Rubber Co.

It's not just "scrap paper"—the essence of successful solvage is selection; the essence of mining, too, is selecting valuable ore from valueless rock.

collectors and their volume is tremendous. The average jalopy has five hundred to six hundred pounds of light iron in its body and fenders, about the same amount of steel in its frame and axles and some four hundred pounds of cast iron in its motor block. In 1949 auto wreckers scrapped about one and three quarter million passenger cars and trucks. They salvaged two and one half million gross tons of scrap.

Worn-out farm machinery, wreckage from torn-down buildings, ship-breaking and so-called "home scrap" produced by steel mills themselves are other major sources of supply. These materials are cut or broken into manageable size and fed into open hearth, blast or electric furnaces along with ore, limestone and other necessary ingredients. A fifty-fifty mix is normal in the United States, but in other countries the scrap charge may run as high as sixty-five per cent with slight loss in the quality of the finished product.

### Non-Ferrous Metals

The principal non-ferrous metals — copper, brass, zinc, lead, tin, nickel and aluminum—are classified as strategic or critical by the Armed Forces and their salvage is looked upon as tremendously important. In 1947 the recovery rate was: Aluminum, 344,837 short tons; Copper, 961,741 s.t.; Lead, 511,970 s.t.; Tin, 30,054 s.t.; and Zinc, 310,793 s.t., for a total value of \$785,700,686.

All scrap arriving at the warehouses of wholesale metal dealers is carefully cleaned and separated according to the metal and particular specification. "Taint," as scrap sheet and sheet utensil aluminum is called, "shall consist of clean old alloy sheet aluminum of two or more alloys not to contain wrecked airplane sheet and to be free of iron, dirt, oil, grease and all other foreign substance." Woe betide the dealer who forgets *that*.

Iron and brass fittings must be removed from scrap lead. Brass pipe must be free of sediment. Burned or brittle pieces have to be removed by hand from shipments of copper wire. And bulky types of scrap have to be cut to uniform size so they can be fed with ease into the purchasers' furnaces.

To accomplish such miracles, dirt is washed off with gasoline, oil is removed by centrifuging or ignition and, to assure a uniform melt, clippings, turnings and borings often are shoveled manually, time after time.

The end product is worth all this trouble, however. Three quarters of all scrap metal collected is turned into ingots of high quality. The rest is sorted into grades and sold to foundries which do their own melting. More than a thousand large dealers and an equal number of scrap smelters are involved in the trade.

Scrap lead is particularly interesting in that, when re-refined, it has properties as good in all respects as those of new metal. In 1947 the scrap recovery

exceeded production of primary lead for the third straight year—511,970 short tons versus 381,109, with market values of \$146,432,420 and \$126,130,000, respectively. By contrast, mine production of *zinc* in that year was more than double the 310,793 short tons recovered from scrap.

The principal supply of aluminum scrap in recent years has come from salvaged warplanes, although turnings, borings, clippings and old castings such as automobile crankcases are important, as are beaten-up kitchen utensils. Smelter output of secondary aluminum and its alloys topped twenty-four million five hundred thousand pounds in two different months of 1947-1948, actually exceeding the annual consumption of primary aluminum in peacetime. At present, only the electric furnace produces secondary aluminum which is as good as primary but the Aluminum Company of America is putting into operation a caustic soda recovery process which can do the same job. The soda dissolves pure aluminum out of mixed scrap but leaves alloys and other metals untouched. This is expected to boost secondary production far beyond its 1947 total of 344,837 short tons valued at \$97,450,936.

Savings which can be expected from scrap aluminum recovery go far beyond the price differential. Primary production is from bauxite and involves high mining and transportation costs. To produce one pound of the

pure metal, the refiner requires from four to six pounds of bauxite plus ten kilowatt hours of electricity and three quarters of a pound of expensive carbon electrode. If scrap can be substituted for a good percentage of the six hundred thousand short tons of primary metal produced in an average year, the saving will be enormous.

Secondary tin must be removed from plate by means of chlorine gas, other powerful chemicals or electricity. Tin plate contains only about one per cent pure tin so only very large operations are feasible. De-tinning of cans achieved success only under government pressure during World War II. It is doubtful that that drive could be repeated, now that electrolytic tinning has replaced the old hot-dip method and further reduced the thickness of the coating required by the canning industry. For this reason, and the tangled export situation, chemists are frantically seeking a substitute for this critical metal. Meanwhile the comparatively small quantities recovered from scrap sell at a very attractive price—30,054 short tons were valued, in 1947, at \$46,848,000.

Nickel scrap provides another headache for dealers and processors. In order to be acceptable it has to be of ninety-eight to ninety-nine per cent purity and its copper content cannot exceed point five per cent. Even within those limits, there is a total of twenty-eight specified types of the metal. Because of its high copper content, the nickel

alloy known as Monel metal has had a special curse laid upon it by dealers. It is useless for anything but the making of Monel nickel silvers. Despite recovery difficulties, nickel obtained from scrap has more than quadrupled since the start of World War II and now runs in the neighborhood of ten thousand short tons yearly.

The reclamation of precious metals such as gold, silver and platinum may sound attractive to the layman but it is a minor branch of the waste materials industry. Platinum presents some difficulties because it has a high melting point—1,755 degrees C.—and must be worked in small quantities in a crucible, under a gas and oxygen flame. Gold is a problem because it may be alloyed with zinc, tin, copper, nickel, palladium or platinum and scraps may contain everything from steel saw filings and emery dust to bits of glass and precious stones. Gold and silver generally are melted down in gas-air or electric furnaces. One dealer, at least, makes a practice of presenting fine Persian rugs to dentists in his locality. The dentists put down the rugs in their offices. Precious metals scrap from their drillings and fillings fall on them. At the end of several years the dealer exchanges the old rugs for new ones, burns the old ones in a special furnace—and reaps a respectable profit!

### Glass

The glass industry could scarcely survive without scrap, or cullet as it

is called in the trade. To make fine quality glass, it is essential that cullet be mixed with white silica sand, soda and lime. Crystal glassware requires fifty to seventy-five per cent scrap; electric-light bulbs fifty-five to sixty per cent to provide stiffness and high viscosity. The meaning of the term cullet is obscure, by the way. Some glassmakers insist it is a fancy word for "cull." Others say it stems from the French "collet," the glass collar left on the end of a hand-manipulated blowing tube.

Broken glass collected by cullet dealers is stockpiled according to color grades—flint, amber, emerald green, light-green and opal. Flint cullet is further separated into lime, lead and borax grades. Lime flint comes from food and beverage jars and bottles. Lead flint is from television tubes, cut glass and fine tableware. Borax flint was once heat-resisting glassware.

It is pre-sorted on an endless belt, resorted by hand and cleaned. Bottle tops and other metal contaminants are removed by magnets. Chemicals remove food particles. Then it is washed, dried, crushed to powder and bagged for shipment. In addition to being incorporated in new batches of glass, it is used by the match industry as an abrasive and filler and is turned into spun glass and spun glass decorative fabrics. The "angel's hair" seen on Christmas trees and holiday decorations in shop windows is made from cullet and consists of fibers drawn to

a fineness of fifteen microns of one twelve thousandth of an inch.

Such strands are spun, two hundred at once, onto a steel drum traveling thirty miles an hour. When a break occurs in any strand an operator repairs it instantly with a dab of molten glass.

One company making spun glass consumes one hundred fifty thousand pounds of cullet annually. This is only a small part of the total fifty-thousand-ton production.

### Plastic Scrap

A comparatively recent development within the waste materials industry has been the processing of large quantities of plastic scrap. The problem of what to do with thermosetting plastics—the kind used to make hard molded objects such as telephone receivers and cases for radios—has never been completely solved. If spotted before they have hardened, defective pieces may sometimes be straightened or patched by the application of heat and pressure. Otherwise they are ground to powder and used in the manufacture of second-quality articles such as toys. These usually have a mottled appearance because it is extremely difficult to separate the scrap sufficiently to assure clear colors.

Reclamation of thermoplastic waste into flexible materials such as shower curtains is comparatively simple and secondary products compare favorably with primaries. During the war, some

fabricators got into trouble when it was found that their products had a tendency to do such things as take the varnish off of furniture. They have since regained favor with their customers by buying scrap from qualified reclaimers under rigid specifications. They produce articles that give satisfactory service but have not yet solved the puzzle of obtaining clear and brilliant colors.

### Rubber

The rubber industry was founded on scrap and has made extensive use of it through the years. The primitive garters and overshoes made in England in the eighteenth century literally were peeled out of balls or jars made from tree latex by Indians of the Amazon basin. Charles Macintosh of Scotland became the first reprocessor of rubber when he dissolved latex in naphtha and coated fabrics, including that famous raincoat, with the mixture.

Charles Goodyear's vulcanizing process made automobile tires possible but for years thereafter no way could be found to "devulcanize" rubber for reuse. The road block was broken when it was learned that sulphuric acid or caustic soda would dissolve the vulcanizing sulphur and make old rubber almost as useful as new.

The importance of secondary rubber was demonstrated during the war when emergency scrap collections enabled the United States to stretch its

stockpile until plants could be built for the manufacture of synthetics. But the synthetics themselves threatened for a time to ruin the dealers. It seemed impossible, at first, to separate the natural and artificial gums. Eventually, careful segregation and blending produced mixtures that had some of the best characteristics of the new and old types. Latest available statistics show that tires and tubes of all varieties now provide more than three-fourths of America's reclaimed rubber. In 1946 the total amounted to 275,400 long tons with an approximate value of \$45,000,000. And the collectors thrive despite the fact that the market value of reclaimed rubber is only about a third of that of new crude.

### Organic Wastes

Important as is the recovery of metals, synthetics, glass and chemicals, it is probable that the reprocessing of organic products such as wood, leather, wool and cotton rags and linters, paper, fats, greases and animal, vegetable and mineral oils will, in the long run, contribute even more to the health and well-being of future Americans.

It is estimated, for example, that nearly two-thirds of the potential wealth of our forests is being wasted. Those wastes, which have mounted to 172,200,000 cubic feet of lumber in the New England region alone, consist largely of: 1) Parts of trees burned by

lumbermen or left to rot in the woods; 2) bark; 3) waste such as sawdust and shavings.

It is obvious that all of every tree cut can never be used. Yet enough is known by chemists, processors and foresters to reduce the waste to reasonable proportions. Leaving aside the necessity for better control of forest fires and for the rebuilding of our forests so they will produce larger percentages of useful timber, much remains to be done.

To cite just a few examples: It is now quite possible to use waste wood of all kinds, including bark, to make fuel briquets, and even fireplace logs that are useful as well as ornamental. Sawdust and shavings, as well as formerly worthless hardwood trees, can now be made into paper. Veneer chips make good paper, too. Even old railroad cross-ties have been made into acceptable kraft paper by the Southern Research Institute of Birmingham, Alabama.

The cheap, strong glue that builders are clamoring for as a substitute for nails in home construction can be made out of saw logs. So can cork substitutes, floor wax, molasses for stock feed, sugar, calcium sulphate, alcohol, resins, lignin, oxalic acid, tannin, pressed building board and a compound that removes scale and rust from steam boilers.

At least one new medicine has been developed from sulphite pulp mill waste. It is a compound developed by

Dr. Irwin A. Pearl of the staff of the Institute of Paper Chemistry for the treatment of histoplasmosis, a fungus growth sometimes found on the skins of children. In addition, an important chemical for the treatment of vitamin deficiency has been extracted from California sugar pine.

Not too much need be said about textile wastes such as cotton, wool, rayon and other synthetic rags. They are old established industries doing millions of dollars worth of business every year. Cotton waste has endless uses, from the manufacture of gun cotton explosives to disposable baby diapers. Reprocessed wool makes warm clothing available to those who would not otherwise be able to afford it. Other textile wastes are used in everything from fine writing paper to fertilizer. All the conversion processes require endless hours of cooking, washing, bleaching and pulping after initial sorting, picking and decontaminating.

Consumption of waste paper in the United States runs around eight million short tons yearly. Some of this material is used for manufacture of cardboard containers, wall board and roofing paper. Some of it makes the finer grades of drawing, map and music paper.

There are at least a thousand waste-paper sorting establishments. The larger ones use modern industrial engineering equipment to hold manual handling and costs to a minimum. Probably the most difficult process em-

ployed in this field is that for bleaching and de-inking. This work is done in several stages with calcium or sodium hypochlorite, chlorine, caustic soda, sodium carbonate, peroxide and soluble silicates. Tremendous weight losses occur during such treatment, just as they do in similar processing of cotton and wool rags.

For centuries farmers, meat packers and fruit and vegetable canners were plagued, not by the loss, but by the mammoth accumulation of waste materials. Farmers burned their corn-cobs and chicken feathers. The packers contaminated all the sewers of Chicago. The fruit and vegetable men plowed under their pummies, hulls and other remnants until there was no more land left in which to bury them.

That is all being changed now, thanks to the ingenuity of the packers, who found how to use every part of a pig "but the squeal." Although a one-thousand-pound beef animal yields only five hundred forty-three pounds of meat, by-products from what formerly was regarded as waste now account for an additional one hundred sixty-one pounds. And the remaining two hundred ninety-six pounds of waste is shrinking almost daily.

Valuable animal by-products now include wool, skins, strings for musical instruments, chemicals, cosmetics, surgical ligatures, drugs, the quaternary ammonium compounds used in the

manufacture of penicillin and essential to the success of the frozen orange juice industry, glue, buttons, soap, hog hair mattresses, insulation board, air filters, shoe polish, animal feeds, fertilizers, shaving cream, candles, salves, lubricating and bone oil, and gland extracts such as insulin. On the average, cattle raisers are paid almost all that the packers obtain for the meat. The profit in the packing industry comes from the sale of by-products.

Farmers now turn such former waste products as corn cobs into such things as soft-grit polishing dust for fine machinery, soap, furfural, sugar and fillers for plastics and light-weight concrete. When it is realized that twenty million tons of cobs are produced annually the saving can be seen to be tremendous. (Chicken feathers make wall board.)

Vegetable wastes are coming into use for papermaking. Flax and straw wastes and the bagasse residue from the manufacture of cane sugar are turned into wall board or mulch. Leafy wastes, when dried by hot-air blasts, become sources of protein, carotene and riboflavin. Beet tops are made into chick feed or yield large amounts of chlorophyll. Other wastes make cork substitutes, pectin, yeast and cattle feed. Wool fat yields cholesterol for use in the vitamin field. Distillery and brewery wastes make excellent cattle feed called "spent grain."

Of course, all of these blessings do not come unmixed. An example is the comparatively recent development of

the re-refining of automobile lubricating oil. Such processing has been customary for many industrial cutting oils, but when the re-refiners ventured to suggest that their secondary product was *better* than a primary lubricant many of the old-line refiners became quite bitter in their comments. A lot that they said is not even printable. The truth seems to be that crankcase drainings, if properly cleaned and processed by experts, can provide good motor lubrication at a comparatively low cost. Despite claims made by some re-refiners, however, the product is *not* good enough to be left in the crankcase for eight thousand miles or more. As the result of the controversy, on the other hand, some primary refiners are soft-pedaling their recommendations that motor oils invariably be changed after a thousand miles of driving.

In this field, as in a host of other, much more research must be done before definitive answers as to the value, or even the best methods of processing waste materials, can be arrived at. Consider the matter of comparatively "new" metals like magnesium, titanium and zirconium, or the rare earths and "hot" wastes from atomic piles. Except for the first-mentioned, little is known about any of them.

Dealers avoided magnesium like the plague until the very recent past because of the fire hazard, difficulty of identification and complicated re-processing technique. It still plays a



minor role in the secondary recovery industry but many of the problems have been, or are being, overcome. Thus it has been found that solid pieces of scrap can be remelted without danger if dried with the greatest care and freed of oil containing acids. But the best method of disposing of magnesium dust and chips is to burn them under a pile of combustible refuse in some remote spot where the smoke and brilliant light will not be objectionable.

To identify any magnesium which may be mixed with aluminum scrap, the pile is sprayed with a small quantity of point five per cent silver nitrate solution. The chemical turns black on magnesium but does not discolor the aluminum.

The former metal then is melted in open pots of cast carbon steel with very low nickel or copper content in a flux. Workers on the operation wear face shields and clothing fireproofed with ammonium sulfamate or something similar.

The remelt has been found to be valuable in production of magnesium alloys. Scrap, which makes up the bulk of the charge, is added with great care

after a molten bath has been created. Most of this reconversion is done in primary foundries which have the elaborate facilities needed for proper storage and preparation. Dealers still shy away from the metal and standard scrap specifications do not mention it.

Obviously, even more tricky problems will have to be solved before other metals just coming into use can be reclaimed. The field is wide open for bright young men who know their chemistry and physics or who have that sixth sense which seems to be a requirement for those who engage successfully in the waste materials business. All evidence indicates that the rewards for such work will increase rapidly as primary raw materials become more difficult to obtain. It is not too hard to envision a United States where steel, copper and many other materials now in common usage will be made largely from hoarded and precious scrap. Or substitutes may be found for them among plastics, organic products and the few metals, such as magnesium, which can be recovered in limitless supply from sea water.

In other words, gentlemen, the Age of Scrap seems to be at hand.

#### THE END

THE REPRINTS on Leonard Lockhard's "The Improbable Profession" which were mentioned in an earlier issue of **ASTOUNDING** are available at the Editorial offices — price 10 cents each.

# FOOL'S MATE

BY ROBERT SHECKLEY

*There is a pattern in everything in the universe—but that does not prove you can find it!*

Illustrated by Orban

The players met, on the great, timeless board of space. The glittering dots that were the pieces swam in their separate patterns. In that configuration at the beginning, even before the first move was made, the outcome of the game was determined.

Both players saw, and knew which had won. But they played on.

Because the game had to be played out.

"Nielson!"

Lieutenant Nielson sat in front of his gunfire board with an idyllic smile on his face. He didn't look up.

"Nielson!"

The lieutenant was looking at his fingers now, with the stare of a puzzled child.

"Nielson! Snap out of it!" General Branch loomed sternly over him. "Do you hear me, lieutenant?"

Nielson shook his head dully. He started to look at his fingers again, then his gaze was caught by the glittering array of buttons on the gunfire panel.

"Pretty," he said.

General Branch stepped inside the cubicle, grabbed Nielson by the shoulders and shook him.

"Pretty things," Nielson said, gesturing at the panel. He smiled at Branch.

Margraves, second in command, stuck his head in the doorway. He still had sergeant's stripes on his sleeve, having been promoted to colonel only three days ago.

"Ed," he said, "the president's representative is here. Sneak visit."

"Wait a minute," Branch said, "I want to complete this inspection." He grinned sourly. It was one hell of an inspection when you went around finding how many sane men you had left.

"Do you hear me, lieutenant?"

"Ten thousand ships," Nielson said.

"Ten thousand ships—all gone!"

"I'm sorry," Branch said. He leaned forward and slapped him smartly across the face.

Lieutenant Nielson started to cry.

"Hey, Ed—what about that representative?"

At close range, Colonel Margraves' breath was a solid essence of whisky, but Branch didn't reprimand him. If you had a good officer left you didn't reprimand him, no matter what he did. Also, Branch approved of whisky. It was a good release, under the circumstances. Probably better than his own, he thought, glancing at his scarred knuckles.

"I'll be right with you, Nielson, can you understand me?"

"Yes, sir," the lieutenant said in a shaky voice. "I'm all right now, sir."

"Good," Branch said. "Can you stay on duty?"

"For a while," Nielson said. "But, sir—I'm not well. I can feel it."

"I know," Branch said. "You deserve a rest. But you're the only gun officer I've got left on this side of the ship. The rest are in the wards."

"I'll try, sir," Nielson said, looking at the gunfire panel again. "But I hear voices sometimes. I can't promise anything, sir."

"Ed," Margraves began again, "that representative—"

"Coming. Good boy, Nielson." The lieutenant didn't look up as Branch and Margraves left.

"I escorted him to the bridge," Margraves said, listing slightly to starboard as he walked. "Offered him a drink, but he didn't want one."

"All right," Branch said.

"He was bursting with questions," Margraves continued, chuckling to himself. "One of those earnest, tanned State Department men, out to win the war in five minutes flat. Very friendly boy. Wanted to know why I, personally, thought the fleet had been maneuvering in space for a year with no action."

"What did you tell him?"

"Said we were waiting for a consignment of zap guns," Margraves said. "I think he almost believed me. Then he started talking about logistics."

"Hm-m-m," Branch said. There was no telling what Margraves, half drunk, had told the representative. Not that it mattered. An official inquiry into the prosecution of the war had been due for a long time.

"I'm going to leave you here," Margraves said. "I've got some unfinished business to attend to."



"Right," Branch said, since it was all he could say. He knew that Margraves' unfinished business concerned a bottle.

He walked alone to the bridge.

The president's representative was looking at the huge location screen. It covered one entire wall, glowing with a slowly shifting pattern of dots.

The thousands of green dots on the left represented the Earth fleet, separated by a black void from the orange, three-dimensional front slowly changed. As he watched, the fluid, three-dimensional front slowly changed. The armies of dots clustered, shifted, retreated, advanced, moving with hypnotic slowness.

But the black void remained between them. General Branch had been

watching that sight for almost a year. As far as he was concerned, the screen was a luxury. He couldn't determine from it what was really happening. Only the CPC calculators could, and they didn't need it.

"How do you do, General Branch?" the president's representative said, coming forward and offering his hand. "My name's Richard Ellsner."

Branch shook hands, noticing that Margraves' description had been pretty good. The representative was no more than thirty. His tan looked strange, after a year of pallid faces.

"My credentials," Ellsner said, handing Branch a sheaf of papers. The general skimmed through them, noting Ellsner's authorization as Presidential Voice in Space. A high honor for so young a man.

"How are things on Earth?" Branch asked, just to say something. He ushered Ellsner to a chair, and sat down himself.

"Tight," Ellsner said. "We've been stripping the planet bare of radio-actives to keep your fleet operating. To say nothing of the tremendous cost of shipping food, oxygen, spare parts, and all the other equipment you need to keep a fleet this size in the field."

"I know," Branch murmured, his broad face expressionless.

"I'd like to start right in with the president's complaints," Ellsner said with an apologetic little laugh. "Just to get them off my chest."

"Go right ahead," Branch said.

"Now then," Ellsner began, consulting a pocket notebook, "you've had the fleet in space for eleven months and seven days. Is that right?"

"Yes."

"During that time there have been light engagements, but no actual hostilities. You—and the enemy commander—have been content, evidently, to sniff each other like discontented dogs."

"I wouldn't use that analogy," Branch said, conceiving an instant dislike for the young man. "But go on."

"I apologize. It was an unfortunate, though inevitable, comparison. Anyhow, there has been no battle, even though you have a numerical superiority. Is that correct?"

"Yes."

"And you know the maintenance of this fleet strains the resources of Earth. The President would like to know why battle has not been joined?"

"I'd like to hear the rest of the complaints first," Branch said. He tightened his battered fists, but, with remarkable self-control, kept them at his sides.

"Very well. The morale factor. We keep getting reports from you on the incidence of combat fatigue—crack-up, in plain language. The figures are absurd! Thirty per cent of your men seem to be under restraint. That's way out of line, even for a tense situation."

Branch didn't answer.

"To cut this short," Ellsner said, "I would like the answer to those

questions. Then, I would like your assistance in negotiating a truce. This war was absurd to begin with. It was none of Earth's choosing. It seems to the President that, in view of the static situation, the enemy commander will be amenable to the idea."

Colonel Margraves staggered in, his face flushed. He had completed his unfinished business; adding another fourth to his half-drunk.

"What's this I hear about a truce?" he shouted.

Ellsner stared at him for a moment, then turned back to Branch.

"I suppose you will take care of this yourself. If you will contact the enemy commander, I will try to come to terms with him."

"They aren't interested," Branch said.

"How do you know?"

"I've tried. I've been trying to negotiate a truce for six months now. They want complete capitulation."

"But that's absurd," Ellsner said, shaking his head. "They have no bargaining point. The fleets are of approximately the same size. There have been no major engagements yet. How can they—"

"Easily," Margraves roared, walking up to the representative and peering truculently in his face.

"General. This man is drunk." Ellsner got to his feet.

"Of course, you little idiot! Don't you understand yet? *The war is lost!* Completely, irrevocably."

Ellsner turned angrily to Branch. The general sighed and stood up.

"That's right, Ellsner. The war is lost and every man in the fleet knows it. That's what's wrong with the morale. We're just hanging here, waiting to be blasted out of existence."

The fleets shifted and weaved. Thousands of dots floated in space, in twisted, random patterns.

Seemingly random.

The patterns interlocked, opened and closed. Dynamically, delicately balanced, each configuration was a planned move on a hundred thousand mile front. The opposing dots shifted to meet the exigencies of the new pattern.

Where was the advantage? To the unskilled eye, a chess game is a meaningless array of pieces and positions. But to the players—the game may be already won or lost.

The mechanical players who moved the thousands of dots knew who had won—and who had lost.

"Now let's all relax," Branch said soothingly. "Margraves, mix us a couple of drinks. I'll explain everything." The colonel moved to a well-stocked cabinet in a corner of the room.

"I'm waiting," Ellsner said.

"First, a review. Do you remember when the war was declared, two years ago? Both sides subscribed to the Holmstead pact, not to bomb home

planets. A rendezvous was arranged in space, for the fleets to meet."

"That's ancient history," Ellsner said.

"It has a point. Earth's fleet blasted off, grouped and went to the rendezvous." Branch cleared his throat.

"Do you know the CPC's? The Configuration-Probability-Calculators? They're like chess players, enormously extended. They arrange the fleet in an optimum attack-defense pattern, based on the configuration of the opposing fleet. So the first pattern was set."

"I don't see the need—" Ellsner started, but Margraves, returning with the drinks, interrupted him.

"Wait, my boy. Soon there will be a blinding light."

"When the fleets met, the CPC's calculated the probabilities of attack. They found we'd lose approximately eighty-seven per cent of our fleet, to sixty-five per cent of the enemy's. If they attacked, they'd lose seventy-nine per cent, to our sixty-four. That was the situation as it stood then. By extrapolation, their *optimum* attack pattern—at that time—would net them a forty-five per cent loss. Ours would have given us a seventy-two per cent loss."

"I don't know much about the CPC's," Ellsner confessed. "My field's psych." He sipped his drink, grimaced, and sipped again.

"Think of them as chess players," Branch said. "They can estimate the loss probabilities for an attack at any

given point of time, in any pattern. They can extrapolate the probable moves of both sides.

"That's why battle wasn't joined when we first met. No commander is going to annihilate his entire fleet like that."

"Well then," Ellsner said, "why haven't you exploited your slight numerical superiority? Why haven't you gotten an advantage over them?"

"Ah!" Margraves cried, sipping his drink. "It comes, the light!"

"Let me put it in the form of an analogy," Branch said. "If you have two chess players of equally high skill, the game's end is determined when one of them gains an advantage. Once the advantage is there, there's nothing the other player can do, unless the first makes a mistake. If everything goes as it should, the game's end is predetermined. The turning point may come a few moves after the game starts, although the game itself could drag on for hours."

"And remember," Margraves broke in, "to the casual eye, there may be no apparent advantage. Not a piece may have been lost."

"That's what's happened here," Branch finished sadly. "The CPC units in both fleets are of maximum efficiency. But the enemy has an edge, which they are carefully exploiting. And there's nothing we can do about it."

"But how did this happen?" Ellsner asked. "Who slipped up?"

"The CPC's have inducted the cause of the failure," Branch said. "The end of the war was inherent *in our take-off formation.*"

"What do you mean?" Ellsner said, setting down his drink.

"Just that. The configuration the fleet was in, light-years away from battle, before we had even contacted their fleet. When the two met, they had an infinitesimal advantage of position. That was enough. Enough for the CPC's, anyhow."

"If it's any consolation," Margraves put in, "it was a fifty-fifty chance. It could have just as well been us with the edge."

"I'll have to find out more about this," Ellsner said. "I don't understand it all yet."

Branch snarled: "The war's lost. What more do you want to know?"

Ellsner shook his head.

"Wilt snare me with predestination 'round," Margraves quoted, "and then impute my fall to sin?"

Lieutenant Nielson sat in front of the gunfire panel, his fingers interlocked. This was necessary, because Nielson had an almost overpowering desire to push the buttons.

The pretty buttons.

Then he swore, and sat on his hands. He had promised General Branch that he would carry on, and that was important. It was three days since he had seen the general, but he was determined to carry on. Resolutely

he fixed his gaze on the gunfire dials.

Delicate indicators wavered and trembled. Dials measured distance, and adjusted aperture to range. The slender indicators rose and fell as the ship maneuvered, lifting toward the red line, but never quite reaching it.

The red line marked emergency. That was when he would start firing, when the little black arrow crossed the little red line.

He had been waiting almost a year now, for that little arrow. Little arrow. Little narrow. Little arrow. Little narrow.

Stop it.

That was when he would start firing.

Lieutenant Nielson lifted his hands into view and inspected his nails. Fastidiously he cleaned a bit of dirt out of one. He interlocked his fingers again, and looked at the pretty buttons, the black arrow, the red line.

He smiled to himself. He had promised the general. Only three days ago.

So he pretended not to hear what the buttons were whispering to him.

"The thing I don't see," Ellsner said, "is why you can't do something about the pattern? Retreat and regroup, for example?"

"I'll explain that," Margraves said. "It'll give Ed a chance for a drink. Come over here." He led Ellsner to an instrument panel. They had been showing Ellsner around the ship for three days, more to relieve their own tension than for any other reason. The



last day had turned into a fairly prolonged drinking bout.

"Do you see this dial?" Margraves pointed to one. The instrument panel covered an area four feet wide by twenty feet long. The buttons and switches on it controlled the movements of the entire fleet.

"Notice the shaded area. That marks the safety limit. If we use a forbidden configuration, the indicator goes over and all hell breaks loose."

"And what is a forbidden configuration?"

Margraves thought for a moment. "The forbidden configurations are those which would give the enemy an attack advantage. Or, to put it in another way, moves which change the attack-probability-loss picture sufficiently to warrant an attack."

"So you can move only within strict limits?" Ellsner asked, looking at the dial.

"That's right. Out of the infinite number of possible formations, we can use only a few, if we want to play safe. It's like chess. Say you'd like to put a sixth row pawn in your opponent's back row. But it would take two moves to do it. And after you move to the seventh row, your opponent has a clear avenue, leading inevitably to checkmate.

"Of course, if the enemy advances too boldly the odds are changed again, and we attack."

"That's our only hope," General Branch said. "We're praying they do

something wrong. The fleet is in readiness for instant attack, if our CPC shows that the enemy has overextended himself anywhere."

"And that's the reason for the crack-ups," Ellsner said. "Every man in the fleet on nerves' edge, waiting for a chance he's sure will never come. But having to wait anyhow. How long will this go on?"

"This moving and checking can go on for a little over two years," Branch said. "Then they will be in the optimum formation for attack, with a twenty-eight per cent loss probability to our ninety-three. They'll have to attack then, or the probabilities will start to shift back in our favor."

"You poor devils," Ellsner said softly. "Waiting for a chance that's never going to come. Knowing you're going to be blasted out of space sooner or later."

"Oh, it's jolly," said Margraves, with an instinctive dislike for a civilian's sympathy.

Something buzzed on the switchboard, and Branch walked over and plugged in a line. "Hello? Yes. Yes. . . . All right, Williams. Right." He unplugged the line.

"Colonel Williams has had to lock his men in their rooms," Branch said. "That's the third this month. I'll have to get CPC to dope out a formation so we can take him out of the front." He walked to a side panel and started pushing buttons.

"And there it is," Margraves said.

"What do you plan to do, Mr. Presidential Representative?"

The glittering dots shifted and deployed, advanced and retreated, always keeping a barrier of black space between them. The mechanical chess players watched each move, calculating its effect into the far future. Back and forth across the great chess board the pieces moved.

The chess players worked dispassionately, knowing beforehand the outcome of the game. In their strictly ordered universe there was no possible fluctuation, no stupidity, no failure.

They moved. And knew. And moved.

"Oh, yes," Lieutenant Nielson said to the smiling room. "Oh, yes." And look at all the buttons, he thought, laughing to himself.

So stupid. Georgia.

Nielson accepted the deep blue of sanctity, draping it across his shoulders. Bird song, somewhere.

Of course.

Three buttons red. He pushed them. Three buttons green. He pushed them. Four dials. Riverread.

*"Oh-oh. Nielson's cracked."*

"Three is for me," Nielson said, and touched his forehead with greatest stealth. Then he reached for the keyboard again. Unimaginable associations raced through his mind, produced by unaccountable stimuli.

*"Better grab him. Watch out!"*

Gentle hands surround me as I push

two are brown for which is for mother, and one is high for all rest.

*"Stop him from shooting off those guns!"*

I am lifted into the air, I fly, I fly.

"Is there any hope for that man?" Ellsner asked, after they had locked Nielson in a ward.

"Who knows," Branch said. His broad face tightened; knots of muscle pushed out his cheeks. Suddenly he turned, shouted, and swung his fist wildly at the metal wall. After it hit, he grunted and grinned sheepishly.

"Silly, isn't it? Margraves drinks. I let off steam by hitting walls. Let's go eat."

The officers ate separate from the crew. Branch had found that some officers tended to get murdered by psychotic crewmen. It was best to keep them apart.

During the meal, Branch suddenly turned to Ellsner.

"Boy, I haven't told you the entire truth. I said this would go on for two years? Well, the men won't last that long. I don't know if I can hold this fleet together for two more weeks."

"What would you suggest?"

"I don't know," Branch said. He still refused to consider surrender, although he knew it was the only realistic answer.

"I'm not sure," Ellsner said, "but I think there may be a way out of your dilemma." The officers stopped eating and looked at him.



"Have you got some superweapons for us?" Margraves asked. "A disintegrator strapped to your chest?"

"I'm afraid not. But I think you've been so close to the situation that you don't see it in its true light. A case of the forest for the trees."

"Go on," Branch said, munching methodically on a piece of bread.

"Consider the universe as the CPC sees it. A world of strict causality. A logical, coherent universe. In this

world, every effect has a cause. Every factor can be instantly accounted for.

"That's not a picture of the real world. There *is no* explanation for everything, really. The CPC is built to see a specialized universe, and to extrapolate on the basis of that."

"So," Margraves said, "what would you do?"

"Throw the world out of joint," Ellsner said. "Bring in uncertainty. Add a human factor that the machines

can't calculate."

"How can you introduce uncertainty in a chess game?" Branch asked, interested in spite of himself.

"By sneezing at a crucial moment, perhaps. How could a machine calculate that?"

"It wouldn't have to. It would just classify it as extraneous noise, and ignore it."

"True." Ellsner thought for a moment. "This battle—how long will it take once the actual hostilities are begun?"

"About six minutes," Branch told him. "Plus or minus twenty seconds."

"That confirms an idea of mine," Ellsner said. "The chess game analogy you use is faulty. There's no real comparison."

"It's a convenient way of thinking of it," Margraves said.

"But it's an *untrue* way of thinking of it. Checkmating a king can't be equated with destroying a fleet. Nor is the rest of the situation like chess. In chess you play by rules previously agreed upon by the players. In this game you can make up your own rules."

"This game had inherent rules of its own," Branch said.

"No," Ellsner said. "Only the CPC's have rules. How about this? Suppose you dispensed with the CPC's? Gave every commander his head, told him to attack on his own, with no pattern. What would happen?"

"It wouldn't work," Margraves told

him. "The CPC can still total the picture, on the basis of the planning ability of the average human. More than that, they can handle the attack of a few thousand second-rate calculators—humans—with ease. It would be like shooting clay pigeons."

"But you've *got* to try something," Ellsner pleaded.

"Now wait a minute," Branch said. "You can spout theory all you want. I know what the CPC's tell me, and I believe them. I'm still in command of this fleet, and I'm not going to risk the lives in my command on some harebrained scheme."

"Harebrained schemes sometimes win wars," Ellsner said.

"They usually lose them."

"The war is lost already, by your own admission."

"I can still wait for them to make a mistake."

"Do you think it will come?"

"No."

"Well then?"

"I'm still going to wait."

The rest of the meal was completed in moody silence. Afterward, Ellsner went to his room.

"Well, Ed?" Margraves asked, unbuttoning his shirt.

"Well yourself," the general said. He lay down on his bed, trying not to think. It was too much. Logistics. Predetermined battles. The coming debacle. He considered slamming his fist against the wall, but decided against it.

It was sprained already. He was going to sleep.

On the borderline between slumber and sleep, he heard a click.

The door!

Branch jumped out of bed and tried the knob. Then he threw himself against it.

Locked.

"General, please strap yourself down. We are attacking." It was Ellsner's voice, over the intercom.

"I looked over that keyboard of yours, sir, and found the magnetic doorlocks. Mighty handy in case of a mutiny, isn't it?"

"You idiot!" Branch shouted. "You'll kill us all! That CPC—"

"I've disconnected our CPC," Ellsner said pleasantly. "I'm a pretty logical boy, and I think I know how a sneeze will bother them."

"He's mad," Margraves shouted to Branch. Together they threw themselves against the metal door.

Then they were thrown to the floor.

"All gunners—fire at will!" Ellsner broadcasted to the fleet.

The ship was in motion. The attack was underway!

The dots drifted together, crossing the no man's land of space.

They coalesced! Energy flared, and the battle was joined.

Six minutes, human time. Hours for the electronically fast chess player. He checked his pieces for an instant, deducing the pattern of attack.

There was no pattern!

Half of the opposing chess player's pieces shot out into space, completely out of the battle. Whole flanks advanced, split, rejoined, wrenched forward, dissolved their formation, formed it again.

No pattern? There *had* to be a pattern. The chess player knew that everything had a pattern. It was just a question of finding it, of taking the moves already made and extrapolating to determine what the end was supposed to be.

The end was—chaos!

The dots swept in and out, shot away at right angles to the battle, checked and returned, meaninglessly.

What did it mean, the chess player asked himself with the calmness of metal. He waited for a recognizable configuration to emerge.

Watching dispassionately as his pieces were swept off the board.

"I'm letting you out of your room now," Ellsner called, "but don't try to stop me. I think I've won your battle."

The lock released. The two officers ran down the corridor to the bridge, determined to break Ellsner into little pieces.

Inside, they slowed down.

The screen showed the great mass of Earth dots sweeping over a scattering of enemy dots.

What stopped them, however, was Nielson, laughing, his hands sweeping

over switches and buttons on the great master control board.

The CPC was droning the losses. "Earth—eighteen per cent. Enemy—eighty-three. Eighty-four. Eighty-six. Earth, nineteen per cent."

"Mate!" Ellsner shouted. He stood beside Neilson, a Stillson wrench clenched in his hand. "Lack of pattern. I gave their CPC something it couldn't handle. An attack with no apparent pattern. Meaningless configurations!"

"But what are they doing?" Branch asked, gesturing at the dwindling enemy dots.

"Still relying on their chess player," Ellsner said. "Still waiting for him to dope out the attack pattern in this

madman's mind. Too much faith in machines, general. This man doesn't even know he's precipitating an attack."

*. . . And push three that's for dad  
on the olive tree I always wanted to two  
two two Danbury fair with buckle shoe  
brown all brown buttons down and in,  
sin, eight red for sin—*

"What's the wrench for?" Margraves asked.

"That?" Ellsner weighed it in his hand. "That's to turn off Neilson here, after the attack."

*. . . And five and love and black, all  
blacks, fair buttons in I remember when  
I was very young at all push five and  
there on the grass ouch—*

THE END

## IN TIMES TO COME

Next issue starts several important items. First off, Hal Clement's new novel, "A Mission of Gravity" begins. The hero is a rough, tough, case-hardened individual. He's a trader-explorer sea-captain, on a world with a culture at about the confused level Earth had around 1450 A.D. And he's tough — you'd be surprised how tough! He's a little guy, really — but then, you don't grow very big, but you do grow very, very tough when the surface gravity in your homeland runs between 400 and 700 G! Where a dropped pebble vanishes with an acceleration about equal to that of a bullet in a revolver barrel. And where muscles as tough as steel would be useless — steel's too flimsy!

Also beginning next month is the new bonus for authors policy. You readers, by your votes, can give a man who's done a sound, clean job of story-building, a bonus pat on the back. The story that wins first place in reader opinion in the April issue will earn a 4¢ rate — your votes will determine which one that is.

A postcard listing your selections in order will be of real help to both myself and my team — the authors.

THE EDITOR.

# NULL-ABC

BY H. BEAM PIPER AND JOHN J. McGUIRE

*Second of two parts. Even if you hold literacy to be the cause of large-scale war, it's remarkable what high-powered battling can be arranged without the aid of the written word—!*

Illustrated by Pawelka

## SYNOPSIS

There had been the World Wars, and the cold-war interbellum periods: huge armament budgets, tax-saturation, no money to spare for public schools already clogged by a rising birth rate. There had been fantastic "progressive" education experiments. Even by the middle of the Twentieth Century, in some of the larger cities, children were leaving grade school unable to read, and in a world in which radio, television and moving pictures were supplanting the printed page, there was less and less incentive or desire to learn. By the end of World War IV, illiteracy had become

the rule rather than the exception, and by the beginning of the Twenty-second Century, what little reading and writing was necessary to maintain a civilized order of society was being done by members of the tightly-organized Associated Fraternities of Literates. It was only natural that these should become targets for the resentment of the Illiterate public whom they served, partly because of their monopolistic practices and extortionate fees, and partly from a general attitude of anti-intellectualism which was one of the heritages from the wars and upheavals of the Twentieth and Twenty-first Centuries.

Chester Pelton, Radical-Socialist can-

*didate for the Senate of the Consolidated States of North America, has made himself spokesman for this attitude and this resentment. A wealthy Illiterate department store owner who must at all times employ at least fifty Literates in his business, he advocates a program of socialized Literacy, with the slogan: Put the Literates in their place; our servants, not our masters!*

*Even on the morning before the election, he is still unaware that his daughter, Claire, and his son, Raymond, are both Literates, though not Fraternities members, that Claire is carrying on a secret love affair with Ralph Prestonby, Raymond's high-school principal, who has taught both of them to read, or that his own campaign manager, Frank Cardon, ostensibly an Illiterate brewery-owner, is actually an undercover Literate, as is Russell Latterman, sales manager at Pelton's Purchasers' Paradise.*

*Inside the Associated Fraternities of Literates, a bitter struggle is going on between two factions, one headed by Wilton Joyner and Harvey Graves, who fear the immediate results of Pelton's program and are trying to defeat him at the polls, and the other led by William R. Lancedale, who realizes that socialized Literacy can only be directed by Literates and that, in the long run, it will place them in control of the government. Both Cardon and Prestonby are adherents of Lancedale's; Prestonby is secretly teaching reading and writing at his Illiterate high school as a part of the Lancedale Plan. Latterman is working for Joyner*





and Graves to defeat Pelton; he arranges to open the fall sale at Pelton's store on the day before the election to distract the candidate from his political campaign.

In addition, Latterman has contrived a situation which has resulted in exposing Claire Pelton's Literacy, and has fomented a walkout of the Literates at Pelton's store. Cardon is having trouble convincing some of Pelton's Illiterate followers that their candidate is not betraying them; Lancedale formulates a plan by which the exposure of Claire's Literacy can be used to win sympathy for her father.

Prestonby, leaving Ray Pelton in care of his bodyguard, Doug Yetko, goes to the store to help Claire, who is trying to handle the sale alone after her father has suffered a heart attack. Shortly after his arrival, a riot is started there by Pelton's political opponents, the Independent-Conservatives.

## PART 2

Cardon looked at his watch as he entered the Council Chamber at Literates' Hall, smoothing his smock hastily under his Sam Browne. He'd made it with very little time to spare, before the doors would be sealed and the meeting would begin. He'd been all over town, tracking down that report of Sforza's; he'd even made a quick visit to Chinatown, on the off chance that "China" had been used in an attempt at the double concealment of the obvious, but, as he'd expected, he'd found nothing. The peo-

ple there hardly knew there was to be an election. Accustomed for millennia to ideographs read only by experts, they viewed the current uproar about Literacy with unconcern.

At the door, he deposited his pocket recorder—no sound-recording device was permitted, except the big audiovisual camera in front, which made the single permanent record. Going around the room counterclockwise to the seats of his faction, he encountered two other Lancedale men: Gerald K. Toppington, of the Technological Section, thin-faced, sandy-haired, balding; and Franklin R. Chernov, commander of the local Literates' guards brigade, with his ragged gray mustache, his horribly scarred face, and his outsize tablet-holster almost as big as a mail-order catalogue.

"What's Joyner-Graves trying to do to us, Frank?" Chernov rumbled gutturally.

"It's what we're going to do to them," Cardon replied. "Didn't the chief tell you?"

Chernov shook his head. "No time. I only got here fifteen minutes ago. Chasing all over town about that tip from Sforza. Nothing, of course. Nothing from Sforza, either. The thing must have been planned weeks ago, whatever it is, and everybody briefed personally, and nothing on disk or tape about it. But what's going to happen here? Lancedale going to pull a rabbit out of his hat?"

Cardon explained. Chernov whis-

tled. "Man, that's no rabbit; that's a full-grown Bengal tiger! I hope it doesn't eat us, by mistake."

Cardon looked around, saw Lancedale in animated argument with a group of his associates. Some of the others seemed to be sharing Chernov's fears.

"I have every confidence in the chief," Toppington said. "If his tigers make a meal off anybody, it'll be—" He nodded in the direction of the other side of the chamber, where Wilton Joyner, short, bald, pompous, and Harvey Graves, tall and cadaverous, stood in a Rosencrantz-Guildenstern attitude, surrounded by half a dozen of their top associates.

The Council President, Morehead, came out a little door onto the rostrum and took his seat, pressing a button. The call bell began clanging slowly. Lancedale, glancing around, saw Cardon and nodded. On both sides of the chamber, the Literates began taking seats, and finally the call bell stopped, and Literate President Morehead rapped with his gavel. The opening formalities were hustled through. The routine held-over business was rubber-stamped with hasty votes of approval, even including the decisions of the extemporary meeting of that morning on the affair at Pelton's. Finally, the presiding officer rapped again and announced that the meeting was now open for new business.

At once, Harvey Graves was on his

feet.

"Literate President," he began, as soon as the chair had recognized him, "this is scarcely *new* business, since it concerns a problem, a most serious problem, which I and some of my colleagues have brought to the attention of this Council many times in the past—the problem of Black Literacy!" He spat out the two words as though they were a mouthful of poison. "Literate President and fellow Literates, if anything could destroy our Fraternities, to which we have given our lives' devotion, it would be the widespread tendency to by-pass the Fraternities, the practice of Literacy by non-Fraternities people—"

"We've heard all that before, Wilton!" somebody from the Lancedale side called out. "What do you want to talk about that you haven't gotten on every record of every meeting for the last thirty years?"

"Why, this Pelton business," Graves snapped back at him. "You know what I mean. Your own associates are responsible for it!" He turned back to face the chair, and, with a surprising minimum of invective, described the scene in which Claire Pelton had demonstrated her Literacy. "And that's not all, brother Literates," he continued. "Since then, I've been receiving reports from the Pelton store. Claire Pelton has been openly doing the work of a Literate; going over the store's written records, checking inventories, checking the

credit guide, handling the price lists—”

“What’s that got to do with Black Literacy?” Gerald Toppington demanded. “Black Literacy is a term which labels the professional practice of Literacy, for hire, by a non-Fraternity Literate, or Literate service furnished for criminal or politically subversive purposes, or the betrayal of a client by a Fraternity Literate. There’s nothing of the sort involved here. This girl, who does appear to be Literate, is simply looking after the interests of her family’s business.”

“She was taught by a Literate, a Fraternities member, under, to say the very least, irregular circumstances, and without payment of any fee. Any fee, that is, that the Fraternities can collect any percentage on. And the Literate who taught her also taught her younger brother, Ray Pelton, and this Literate, who is known to be her lover—”

“Suppose he is her lover, so what?” one of Lancedale’s partisans demanded. “You say, yourself, that she’s a Literate. That ought to remove any objection. Why, if she were to come forward and admit and demonstrate her Literacy, there’d be no possible objection from the Fraternities’ viewpoint to her marrying young Prestonby.”

“And as for Prestonby’s action in teaching Literacy to her and to her brother,” Cardon spoke up, “I think he deserves the thanks and commendation of the Fraternities. He’s put a

period to four generations of bigoted Illiterates.”

Wilton Joyner was on his feet. “Will Literate Graves yield for a motion?” he asked. “Thank you, Harvey, Literate President, and brother Literates: I yield to no man in my abhorrence of Black Literacy, or in my detestation for the political principles of which Chester Pelton has made himself the spokesman, but I deny that we should allow the acts and opinions of the Illiterate parent to sway us in our consideration of the Literate children. It has come to my notice, as it has to Literate Graves’, that this young woman, Claire Pelton, is Literate to a degree that would be a credit to any Literate First Class, and her brother can match his Literacy creditably against that of any novice in our Fraternities. To show that we respect Literate ability, wherever we find it; to show that we are not the monopolistic closed-corporation our enemies accuse us of being; to show that we are not animated by a vindictive hatred of anything bearing the name of Pelton—I move, and ask that my motion be presented for seconding, that Claire Pelton, and her brother, Raymond Pelton, be duly elected, respectively, to the positions of Literate Third Class and Literate Novice, as members of the Associated Fraternities of Literates!”

From the Joyner-Graves side, there were dutiful cries of, “Yes! Yes! Ad-

mit the young Peltons!" and also gasps of horrified surprise from the rank-and-filers who hadn't been briefed on what was coming up.

Lancedale was on his feet in an instant. "Literate President!" he cried. "In view of the delicate political situation, and in view of Chester Pelton's violent denunciation of our Fraternities—"

"Literate Lancedale," the President objected. "The motion is not to be debated until it has been properly seconded."

"What does the Literate President think I'm doing?" Lancedale retorted. "I second the motion!"

Joyner looked at Lancedale in angry surprise, which gradually became fearful suspicion. His stooge, who had already risen with a prepared speech of seconding, simply gaped.

"Furthermore," Lancedale continued, "I move an amendment to Literate Joyner's motion. I move that the ceremony of the administration of the Literates' Oath, and the investiture in the smock and insignia, be carried out as soon as possible, and that an audio-visual recording be made, and telecast this evening, before twenty-one hundred."

Brigade commander Chernov, prodded by Cardon, jumped to his feet.

"Excellent!" he cried. "I second the motion to amend the motion of Literate Joyner."

If there were such a thing as a bomb which would explode stunned

silence, Lancedale and Chernov had dropped such a bomb. Cardon could guess how Joyner and Graves felt; they were now beginning to be afraid of their own proposition. As for the Lancedale Literates, he knew how many of them felt. He'd felt the same way, himself, when Lancedale had proposed the idea. He got to his feet.

"Literate President, brother Literates," he raised his voice. "I call for an immediate vote on this amended motion, which I, personally, endorse most heartily, and which I hope to see carried unanimously."

"Now, wait a minute!" Joyner objected. "This motion ought to be debated—"

"What do you want to debate about it?" Chernov demanded. "You presented it, didn't you?"

"Well, I wanted to give the Council an opportunity to discuss it, as typical of our problems in dealing with Black . . . I mean, non-Fraternities . . . Literacy—"

"You mean, you didn't know it was loaded!" Cardon told him. "Well, that's your hard luck; we're going to squeeze the trigger!"

"I withdraw the motion!" Joyner shouted.

"Literate President," Lancedale said gently, his thin face lighting with an almost saintly smile, "Literate Joyner simply cannot withdraw his motion, now. It has been properly seconded and placed before the house, and so has my own humble contribu-

tion to it. I demand that the motion be acted upon."

"Vote! Vote! Vote!" the Lancedale Literates began yelling.

"I call on all my adherents to vote against this motion!" Joyner shouted.

"Now look here, Wilton!" Harvey Graves shouted, reddening with anger. "You're just making a fool out of me. This was your idea, in the first place! Do you want to smash everything we've ever done in the Fraternities?"

"Harvey, we can't go on with it," Joyner replied. He crossed quickly to Graves' seat and whispered something.

"For the record," Lancedale said sweetly, "our colleague, Literate Joyner, has just whispered to Literate Graves that since I have seconded his motion, he's now afraid of it. I think Literate Graves is trying to assure him that my support is merely a bluff. For the information of this body, I want to state categorically that it is not, and that I will be deeply disappointed if this motion does not pass."

An elderly Literate on the Joyner-Graves side, an undersized man with a bald head and a narrow mouth, was on his feet. He looked like an aged rat brought to bay by a terrier.

"I was against this fool idea from the start!" he yelled. "We've got to keep the Illiterates down; how are we ever going to do that if we go making Literates out of them? But you two

thought you were being smart—"

"Shut up and sit down, you old jackass!" one of Joyner's people shouted at him.

"Shut up, yourself, Ginter," a hatchet-faced woman Literate from the Finance Section squawked.

Literate President Morehead, an amiable and ineffective maiden aunt in trousers, pounded frantically with his gavel. "Order!" he fairly screamed. "This is disgraceful!"

"You can say that again!" Brigade commander Chernov boomed. "What do you people over on the right think this is; an Illiterates' Organization Political Action meeting?"

"Vote! Vote!" Cardon bellowed.

Literate President Morehead banged his gavel and, in a last effort, started the call bell clanging.

"The motion has been presented and seconded; the amendment has been presented and seconded. It will now be put to a vote!"

"Roll call!" Cardon demanded. Four or five other voices, from both sides of the chamber, supported him.

"The vote will be by roll call," Literate President Morehead agreed. "Addison, Walter G."

"Aye!" He was a subordinate of Harvey Graves.

"Agostino, Pedro V."

"Aye!" He was a Lancedale man.

So it went on. Graves voted for the motion. Joyner voted against it. All the Lancedale faction, now convinced that their leader had the opposition on

the run, voted loudly for it.

"The vote has been one hundred and eighty-three for, seventy-two against," Literate President Morehead finally announced. "The motion is herewith declared carried. Literate Lancedale, I appoint you to organize a committee to implement the said motion, at once."

Prestonby flung open the door of the rest room where Sergeant Coccozello and his subordinate were guarding the unconscious Pelton.

"Sergeant! Who's in charge of store police, now?"

Coccozello looked blank for an instant. "I guess I am," he said. "Lieutenant Dunbar's off on his vacation, in Mexico, and Captain Freizer's in the hospital; he was taken sick suddenly last evening."

Probably poisoned, Prestonby thought, making a mental note to find out which hospital and get in touch with one of the Literate medics there.

"Well, come out here, sergeant, and have a look around the store on the TV. We have troubles."

Coccozello could hear the noise that was still coming out of the darkened screen. As he stepped forward, Claire got another pickup, some distance from the one that had been knocked out. A mob of women customers were surging away from the Chinaware Department, into Glassware; they were running into the shopping crowd there, with considerable disturbance. A cou-

ple of store police were trying to get through the packed mass of humanity, and making slow going of it. Coccozello swore and started calling on his reserves on one of the handphones.

"Wait a moment, sergeant," Prestonby stopped him. "Don't commit any of your reserves down there. We're going to need them to hold the executive country, up here. This is only the start of a general riot."

"Who are you and what do you know about it?" Coccozello challenged.

"Listen to him, Guido," Claire said. "He knows what he's doing."

"Claire, you have some way of keeping a running count of the number of customers in and out of the store, haven't you?" Prestonby asked.

"Why, yes; here." She pointed to an indicator on Chester Pelton's desk, where constantly changing numbers danced.

"And don't you have a continuous check on sales, too? How do they jibe?"

"They don't; look. Sales are away below any expectation from the number of customers, even allowing for shopping habits of a bargain-day crowd. But what's that got to do—"

Prestonby was back at the TV, shifting from pickup to pickup.

"Look, sergeant, Claire. That isn't a normal bargain-day crowd, is it? Look at those groups of men, three or four to a group, shifting around, waiting for something to happen. This store's

been infiltrated by a big goon gang. That business in Chinaware's just the start, to draw our reserves down to the third floor. Look at that, now."

He had a pickup on the twelfth floor, the floor just under the public landing stages, and at the foot of the escalators leading to the central executive block.

"See how they're concentrating, there?" he pointed out. "In that ladies' wear department, there are three men for every woman, and the men are all drifting from counter to counter over in the direction of our escalators."

Coccozello swore again, feelingly. "Literate, you know your stuff!" he said. "That fuss in China is just a feint; this is where they're really going to hit. What do you think it is? Macy & Gimbel's trying to bust up our sale, or politics?"

Prestonby shrugged. "Take your choice. A competitor would concentrate where your biggest volume of sale was going on, though; political enemies would try to get up here, and that's what this gang's trying to do."

"He's absolutely right, Guido," Claire told the sergeant. "Do whatever he tells you."

Sergeant Coccozello looked at him, awaiting orders.

"We can't commit our reserves in that Chinaware Department fight; we need them up here. Where are they, now, and how many?"

"Thirteen, counting myself and the man in there." He nodded toward the room where Chester Pelton lay in drugged sleep. "In the squad room, on the floor below."

"And for the mob below to get up here?"

"Two escalators, sir, northeast and southwest corners of office country. And we got some new counters that Mr. Latterman had built, that didn't get put out in time for the sale. We can use them to build barricades, if we have to."

"How about a 'copter attack on the roof?"

Coccozello grinned. "I'd like to see that, now, Literate. We got plenty of A-A equipment up there—four 7-mm machine guns, two 12-mm's, and one 20-mm auto-cannon. We could hold off the State Guard with that."

"That isn't saying much, but they're not even that good. So it'll be the escalators. Think, now, sergeant. Fires, burglary, holdups—"

The sergeant's grin widened. "High-pressure fire hose, one at the head of each escalator, and a couple more that can be dragged over from other outlets. Say we put two men on each hose, lying down at the head of the escalators. And we got plenty of fire-arms; we can arm some of these clerks, up here—"

"All right; do that. And put out an emergency call, by interdepartment telephone, not by public address, to floorwalkers from the fifth floor down,

to gather up all male clerks and other store personnel in their departments, arm them with anything they can find, and rush them to Chinaware. Tell them to shout 'Pelton!' when they hit the mob, to avoid breaking each others' heads in the confusion, and tell them they're expected to hold the Chinaware and Glassware departments themselves, without any help from the store police."

"Why not?" Claire wanted to know.

"That's how battles come to happen at the wrong time and place," Prestonby told her. "Two small detachments collide, and each sends back for re-enforcements, and the next thing anybody knows, there's a full-size battle going on where nobody wants to fight one. We're going to fight our main battle at the head of the escalators from the twelfth floor."

"You've done this sort of work before, Literate," Coccozello grinned. "You talk like a storm-troop captain. What else?"

"Well, so far, we've just been talking defense. We need to take the offensive, ourselves." He glanced around. "Is there a freight elevator from this block to the basement?"

"Yeah. Wait till I see." Coccozello went to the TV-screen and dialed. "Yeah, and the elevator's up here, too," he said.

"Well, you take what men you can spare—a couple of your cops, and a couple of the office crew—arm them with pistols, carbines, clubs, whatever

you please, and take them down to the basement. Gather up all the warehouse gang, down there, and arm them. And as soon as you get to the basement, send the elevator back up here. That's our life line; we can't risk having it captured. You'll organize flying squads to go up into the store from the basement. Bust up any trouble that seems to be getting started, if you can, but your main mission will be to rescue store police, Literates, Literates' guards, and store help, and get them back to the basement. They'll be picked up from there and brought up here on the elevator." He picked up a pad from a desk and wrote a few lines on it. "Show this to any Literate you meet; get Literate Hopkinson to countersign it for you, when you find him. Tell him we want his whole gang up here as soon as possible."

"How about getting help from outside?" Claire asked. "The city police, or—"

"City police won't lift a finger," Prestonby told her. "They never help anybody who has a private police force; they have too much to do protecting John Q. Citizen. Hutschnecker; suppose you call Radical-Socialist campaign headquarters; tell them to rush some of their Lone Rangers around here—"

Russell M. Latterman was lunching in the store restaurant, at a table next the thick glass partition, where





he could look out across Confectionery and Pastries toward the Tobacco Shoppe and the Liquor Department. There were two ways of looking at it, of course. He was occupying a table that might have been used by a customer, but, on the other hand, he was known by sight to many of the customers, and the fact that he was eating here had some advertising value, and he could keep his eye on the business going on around him. Off in the distance, he caught the white flash of a Literate smock at one of the counters; one of the new crew sent in to replace the ones Bayne

had pulled out. He was glad and at the same time disturbed. He had had his doubts about staging a Literates' strike, and he was almost positive that Wilton Joyner had known nothing about it. The whole thing had been Harvey Graves' idea. There was a serious question of Literate ethics involved, to say nothing of the effect on the public. The trick of forcing Claire Pelton to reveal her secret Literacy was all right, although he wished that it had been Frank Cardon who had opened that safe. Or did he? Cardon would have brazened it out, claimed to have memorized the com-

bination after having learned it by observation, and would probably have gotten away with it. But that silly girl had lost her head afterward, and had gone on to brand herself, irrevocably, as a Literate.

One of the waitresses was hurrying toward him, almost falling over herself in excitement. She began talking when she was ten feet from the table.

"Mr. Latterman! Mr. Latterman!" she was calling to him. "A terrible fight, down in Chinaware—!"

"Well, what do we have store police for?" he demanded. "They can take care of it. Now be quiet, Madge; don't get the customers excited!"

He returned to his lunch, watching, with satisfaction, the crowd that was packing into the Liquor Department, next to the restaurant. That special loss-leader, Old Atom-Bomb Rye, had been a good idea. In the first place, the stuff was fit for nothing but cleaning drains and removing varnish; if he were Pelton, he would have fired that fool buyer who got them overstocked on it. But the audio-advertiser, outside, was reiterating: "*Choice whiskies, two hundred dollars a sixth and up!*" and pulling in the customers, who, when they discovered that the two-hundred-dollar bargain was Old Atom-Bomb, were shelling out five hundred to a grand a sixth for good liquor.

He finished his coffee and got to his feet. Be a good idea to look in on

Liquor, and see how things were going. The department was getting more and more crowded every minute; three customers were entering for every one who left.

On the way, he passed two women, and caught a snatch of conversation:

"Don't go down on the third floor, for Heaven's sake . . . terrible fight . . . smashing everything up—"

Worried, he continued into Liquor, and the looks of the crowd there increased his worries. Too many men between twenty and thirty, all dressed alike, looking alike, talking and acting alike. It looked like a goon-gang infiltration, and he was beginning to see why Harvey Graves had wanted the Literates pulled out, and why Joyner, bound by ethics to do nothing against the commercial interests of Pelton's, had known nothing about it. He started toward a counter, to speak to a clerk, but one of the stocky, quietly-dressed young men stepped in front of him.

"Gimme a bottle of Atom-Bomb," he said. "Don't bother wrapping it."

"Yes, sir." The clerk seemed worried, too. He got the bottle and set it on the counter. "That'll be two C, sir."

"I see you're wearing a Radical-Socialist button," the customer commented. "Because you want to, or because Chet Pelton makes you?"

"Mr. Pelton never interferes with his employees' political convictions," the clerk replied loyally.

Saying nothing, the customer took the bottle, swung it by the neck, and smashed it over the clerk's head, knocking him senseless.

"That's all that rotgut's good for," the customer said, jumping over the counter. "All right, boys; help yourselves!"

For a surprisingly long time, the riot was localized in China, where it had begun. Using, alternately, three TV-pickups around the scene of the disturbance, Prestonby watched its progress, and watched successive details of store personnel, armed with clubs and a few knives and some pistols, hit the riot, shouting their battle cry, and vanish. They were, of course, lambs of sacrifice, however unlamblike their conduct. They were buying time, and they were drawing groups of goons into the action in China and Glassware who might have been making trouble elsewhere.

There was an outbreak on the sixth floor, in Liquor; Claire, touring the store on the other TV-screen, spotted it and called his attention to it. Back of the shattered glass partition, a mob of men were snatching bottles from the shelves and tossing them out to the crowd. One of the clerks, in his gray uniform jacket, was lying unconscious outside. While Prestonby watched, another, and another, came flying out the doorway. A fourth victim, in ordinary business clothes, tattered and disheveled, came flying

out after them, to land in a heap, stunned for an instant, and then pick himself up. Prestonby laughed heartily when he recognized Literate—undercover—First Class Russell M. Latterman.

"I ought to have anticipated that," he said. "Any time there's a riot, the liquor stores are the first things looted. The liquor stores, and the—Claire! See what's going on in Sporting Goods!"

Sporting Goods, between Tools & Hardware and Toys, on the fifth floor, was swamped. One of the clerks was lying on the floor in a puddle of blood, past any help; none of the others were in sight. The gun racks and pistol cases were being cleaned out systematically. This had been organized in advance. There were four or five men working industriously wiping grease out of bores and actions before handing out firearms, and a couple more making sure that the right cartridges went with each weapon. Somebody had brought a small grinding wheel over from Tools and plugged it in, and was grinding points on the foils and épées. Others were collecting baseball bats, golf clubs, and football helmets and catchers' masks. The Tool Department was being stripped of everything that could be used as a weapon, too.

The whole store, by this time, was an approximation of Mutiny in a Madhouse. Dressgoods was being looted by a howling mob of women,

who were pulling bolts of material from shelves and fighting among themselves over them. Somebody had turned on the electric fans, and long streams of flimsy fabric were blowing about like a surrealist maypole dance. Somebody in Household Furnishings had turned on a couple of fans, too, and a mob of hoodlums were opening cans of paint and throwing them into the fan blades.

The little Antiques Department, in a corner of the fourth floor back of the Gift Shoppe, was an island of peace in the general chaos. There was only one way into it, and one of the clerks, who had gotten himself into a suit of Fifteenth Century battle armor, was standing in the entrance, leaning on a two-hand sword. There was blood on the long blade, and more blood splashed on the floor in front of him. He was being left entirely alone.

Hutschnecker, called to the telephone, spoke briefly, listened for a while, spoke again in hearty thanks, and hung up.

"Macy & Gimbel's," he told Prestonby. "They heard about our trouble—probably one of their price-spotters phoned in about it—and they're offering to send twenty of their store-cops to help us out. They'll be landing on our stage in eight minutes, rifles and steel helmets."

Prestonby nodded. It would have been quite conceivable that Pelton's chief competitor had started the riot;

since they hadn't, their offer of armed aid was just as characteristic of the bitter but mutually-respectful rivalries of the commercial world. A few minutes later, another call came in, this time on the visiphone. Prestonby took it when he saw a Literates' Guards officer in the screen and recognized him.

"That you, Prestonby?" the officer, Major Slater, asked in some surprise. "Didn't know you were at Pelton's. What's going on, there?"

Prestonby told him, briefly.

"Yes; we had some of our people at the store, in plain clothes," Slater said. "Just in case of trouble. On Mr. L.'s orders. They reported a riot starting, but naturally, their reports were incomplete. Can you get one of your landing stages cleared for us? We have two hundred men, in twenty 'copters." Then he must have noticed some of the store Illiterates back of Prestonby, and realized that this offer of help to Literacy's worst enemy would arouse suspicion. "Not that we care what happens to Chester Pelton, but we have to protect our own people at the store."

"Yes, of course," Prestonby agreed. "Come in on our north stage. You'll probably find a fight going on on our twelfth floor, just inside. Anybody who's trying to get up the escalators to the office block will be an enemy."

"Right. We're halfway there now." The Literates' Guards officer broke the connection.

"You heard that?" he asked, turning to the others in the office. "If we can hold out till they get here, we're all right. Did you contact Radical-Socialist headquarters, yet, Hutsch-necker?"

"Yes. I talked to a fellow named Yingling. He said that all the party storm troops had been lured out to some kind of a disturbance in North Jersey Borough; he'd try to get them recalled."

Prestonby swore bitterly. "By the time his own party-goons get here, the Literates' Guards and Macy & Gimbel's will have pulled Pelton's bacon off the fire for him. Nice friends he has!"

An alarm buzzer went off suddenly, and an urgent voice came out of the box on the wall:

"Here come the goons! South escalator!"

Prestonby grabbed a burp gun and a canvas musette bag full of clips. By the time he had gotten down to what, in deference to the superstitions of the Illiterate store force, was known as the fourteenth floor, an attack on the north escalator had developed as well. In both cases, the attackers seemed to expect no organized resistance. They simply jumped onto the escalators, adding their own running speed, and came rushing up, firing pistols ahead of them at random.

The defenders, however, had been ready; the fire hoses caught those in the lead and hurled them back.

Some of them vaulted the barrier between the ascending and descending spirals and let themselves be carried down again. Less than five minutes after the buzzer had sounded the warning, the attack stopped. The noise on the twelfth floor increased, however, and, leaning over into the escalator-way, Prestonby could see the rioters firing in the direction of the entrance from the north landing stage. Within a matter of thirty seconds, they began to flee, and a wave of Literates' Guards, in their futuristic "space cadet" uniforms, came pouring in after them.

Douglass MacArthur Yetsko put the burp gun back together again, tried the action, and laid it aside with a sigh. He had cleaned every weapon in his and Prestonby's private arsenal, since lunch, and now he had to admit the unpalatable fact that there was nothing left to do but turn on the TV. Ray had been no company at all; the boy hadn't spoken a word since he'd started rummaging among the captain's books. Gloomily, he snapped on the screen to sample the soap shows.

Della Pallas was in jail again, this time accused of murdering the lawyer who had gotten her acquitted on a previous murder rap. Considering the fact that she had languished in jail for almost a year during the other trial, Yetsko felt that she had a sound motive. Rudolf Barstow, in "Broad-

way Wife," was, like Bruce's spider, spinning his five hundredth web to ensnare the glamorous Marie Knobble. And there was a show about a school-teacher and her class of angelic little tots that almost brought Yetsko's lunch up.

He shifted the dial again; a young Literate announcer was speaking quickly, excitedly:

"... Scene of the riot, already the worst this year, and growing steadily worse. We take you now to downtown Manhattan, where our portable units and commentators have just arrived, and switch you to Ed Morgan."

The screen went black, and Yetsko swore angrily. Ray lifted his head quickly from his book and reached for the sono pistol Yetsko had given him.

"Good afternoon, ladies and gentlemen, and just a moment, until we can give you the picture. We're having what is usually labeled as 'slight technical difficulties,' in this case the difficulty of avoiding having a hole shot in our camera or in your commentator's head. Yes, that's shooting you hear; there, somebody's using an auto rifle! How are you coming, Steve?"

A voice muttered something which, two centuries ago, would have caused an earth-shaking scandal in the whole radio-TV industry.

"Well, till Steve gets things fixed up, a brief review, to date, of what's sure to go down in history as the

Battle of Pelton's Purchasers' Paradise—"

"Huh?" Ray fairly shouted, the book forgotten.

"... Started in the Chinaware Department, as a relatively innocent brawl, and spread to the Liquor Department, and then, all of a sudden, everybody started playing rough. At first, it was suspected that Macy & Gimbel's had sent a goon gang around to break up Pelton's fall sale, but when the former concern rallied to the assistance of their competitor with a force of twenty riflemen, that began to look less likely, and we're beginning to think that it might be the work of some of Pelton's political enemies. About ten minutes ago, Major James F. Slater, of the Literates' Guards, arrived with two hundred of his men, to protect the Literates on duty at the store. They captured the entire twelfth floor, where we are, now, with the exception of the Ladies' Lingerie and Hosiery departments around one of the escalators to the lower floors; here the gang who started the riot, and who are now donning white hoods to distinguish themselves from the various other factions involved, have thrown up barricades of counters and display tables and are fighting bitterly to keep control of the escalator head. Ah, here we are!"

The screen lit suddenly, and they were looking, Ray over Yetsko's shoulder, across the devastated expanse of what had been the Ladies'

Frocks department, toward Lingerie and Hosiery, which seemed to have been thoroughly looted, then stripped of everything that could be used to build a barricade.

"... Seems to have been quite a number of heavy 'copters just landed on the east stage, filled with more goons, probably to re-enforce the gang back of that barricade. The firing's gotten noticeably heavier—"

Yetsko had turned from the screen, and was pawing in the arms locker. For a job like this, he'd need firepower. He took the ten-shot clip from the butt of his pistol and inserted one with a curling hundred-shot drum at the bottom, and shoved two more like it into the pockets of his jacket. And now, something to clear the way with. He took out a three-foot length of weighted fire hose.

Then he saw Ray. That kid was pinning him down, here, while the captain was probably fighting for his life! But the captain'd told him to stay with Ray—He dropped the weighted hose.

"What's the matter, Doug?" the boy asked. "Pick it up and let's get going."

He shook his head. "Can't. The captain told me I had to take care of you."

The boy opened his mouth to speak, closed it again, and thought for a moment. Then he asked:

"Doug, didn't Captain Prestonby

tell you to stay with me?"

"Yes—"

"All right. You do just that, because I'm going to help Claire and the senator. That's who that goon gang's after."

Yetsko considered the proposition for a moment, horrified. Why, this was the captain's girl's kid brother; if anything happened to him—His mind refused to contemplate what the captain would do to him.

"No. You gotta stay here, Ray," he said. "The captain—"

Then his eye caught the screen. Ed Morgan must have found a place where he could run his camera up on an extension rod from behind something; they were looking down, from almost ceiling height, at the barricade, and at the Literates' guards who were firing from cover at it. A sudden blast of automatic-weapons burst from the barricade; more men in white hoods came boiling up the escalator, and they all rushed forward. The few Literates' guards skirmishers were overwhelmed. He saw one of them, a man he knew, Sam Igoe, from Company 5, go down wounded; he saw one of the white-hooded goons pause to brain him with a carbine butt before charging on.

"Why, you dirty rotten Illiterate—!" he roared, retrieving his weighted hose. "Come on, Ray; let's go!"

Ray hesitated, as though in thought. "Ken Dorchin; Harry Cobb; Dick

Hirschfield; Jerry McCarty; Ramon Nogales; Pete Shawne; Tom Hutchinson—”

“Who—?” Yetksko began. “What’ve they gotta do with—?”

“We need a gang; the two of us’d last about as long as a pint of beer at a Dutch picnic.” Ray went to the desk, grabbed a pen, and made a list of names, in a fair imitation of Ralph Prestonby’s neat block-printing. “Give this to the girl outside, and tell her to have them called for and sent in here,” the boy directed. “And see if you can find us some transport. I think there ought to be a couple of big ’copters finished down at the shops. And if you can find a couple more Literates’ guards you can talk into going with us—”

Yetksko nodded and took the paper without question. He was not, and he would be the first to admit it, of the thinking type. He was a good sergeant, but he had to have an officer to tell him what to do. Ray Pelton might be only fifteen years old, but his sister was the captain’s girl, and that put him in the officer class. A very young and recently-commissioned second lieutenant, say, but definitely an officer. Yetksko took the list and looked at it. Like most Literates’ guards, he could read, after a fashion. He recognized the names; the boys were all members of the top floor secret society. He went out and gave the list to Martha Collins.

He’d expected some argument with her, but she seemed to accept Ray Pelton’s printing as Prestonby’s; she began checking room charts and class lists, and calling for the boys to be sent at once to the office. He went out, and down to the ’copter repair shop, where he found that a big four-ton air truck that the senior class had been working on for several weeks was finished.

“That thing been tested, yet?” he asked the instructor.

“Yes; I had it up, myself, this morning. Flew it over to the Bronx and back with a load of supplies.”

“O. K. Have somebody you can trust—one of your guards, preferably—bring it around behind the Administration Wing. Captain Prestonby wants it. I’m to take some boys from Fourth Year Civics on a tour. Something about election campaign methods.”

The instructor called a Literates’ guard and gave him instructions. Yetksko went to the guards’ squad room on the second floor, where he found half a dozen of the reserves loafing.

“All right; you guys start earning your pay,” he said. “We’re going to a party.”

The men got to their feet and began gathering their weapons.

“Mason,” he continued, “you have your big ’copter here; the gang of you can all get in it. I’m taking off in a four-ton truck, with some of these



kids. I want you boys to follow us. We're going to Pelton's store. There's a fight going on there, and the captain's in the middle of it. We gotta get him out."

They all looked at him in puzzled surprise, but nobody gave him any argument. Funny, now that he thought of it; it had been quite a long time since anybody had ever given him any argument about anything. A couple of guys out in Pittsburgh had tried it, but somehow they'd lost interest in arguing, after a little—

When he returned to the office and opened the door, a blast of shots greeted him through the open door of Prestonby's private office. He had his pistol out before he realized that the shooting was going on at Pelton's Purchasers' Paradise, ten miles away. Literate Martha Collins, in the inner room, was fairly screaming: "Shut that infernal thing off and listen to me!"

The dozen-odd boys whom Ray had recruited for the improvised relief-expedition were pulling weapons out of the gun locker, pawing through the boxes on the ammunition shelf, trying to explain to one another the working of machine carbines and burp guns. Yetsko shouldered through them and turned down the sound volume of the TV.

"This is absolutely outrageous!" Literate Martha Collins stormed at him. "You ought to be ashamed of yourself, taking these children to a murderous battle like that—"

"Well, maybe it ain't right, using savages in a civilized riot," Yetsko admitted, "but I don't care. The captain's in a jam, and I'd use live devils, if I could catch a few." He took a burp gun from one of the boys, who had opened the action and couldn't get it closed again. "Here; you kids don't want this kinda stuff," he reproved. "Sono guns, and sleep-gas guns, that's all right. But these things are killing tools!"

"It's what we'll have to use, Doug," Ray told him. "Things have been happening, since you went out. Look at the screen."

Yetsko looked, and swore blisteringly. Then he gave the burp gun back to the boy.

"Look; you gotta press this little gismo, here, to let the action shut when there's no clip in, or when the clip's empty. When you got a loaded clip in, you just pull back on this and let go —"

Frank Cardon looked at his watch, and saw that it was 1345, as it had been ten seconds before, when he had last looked. He started to drum nervously on his chair arm with his fingers, then caught himself as he saw Lancedale, who must have been every bit as anxious as himself, standing outwardly calm and unruffled.

"Well, that's the situation which now confronts us, brother Literates," the slender, white-haired man was finishing. "You must see, by now,

that the policy of unyielding opposition which some of you have advocated and pursued is futile. You know the policy I favor, which now remains the only policy we can follow; it is summed up in that law of political strategy: If you can't lick 'em, join 'em, and, after joining, take control.

"In spite of the Radical-Socialist victory in this state at tomorrow's election, it will not be possible, in the next Congress, to enact Pelton's socialized Literacy program into law. The Radicals will not be able to capture enough seats in the lower house, and there are too many uncontested seats in the Senate now held by Independent-Conservatives. But, and this is inevitable, barring some unforeseen accident of the order of a political cataclysm, they will control both houses of Congress after the election of 2144, two years hence, and we can also be sure that two years hence Chester Pelton will be nominated and overwhelmingly elected president of the Consolidated States of North America. Six months thereafter, the socialized Literacy program will be the law of the land.

"So, we have until mid-2145 to make our preparations. I would estimate that, if we do not destroy ourselves by our own folly in the meantime, we should, two years thereafter, be in complete if secret control of the whole Consolidated States Government. If any of you question that last statement, you can merely ask your-

selves one question: How, in the name of all that is rational, can Illiterates control and operate a system of socialized Literacy? Who but Literates can keep such a program from disintegrating into complete and indescribable confusion?

"I don't ask for any decision at this time. I do not ask for any debate at this time. Let each of us consider the situation in his or her own mind, and let us meet again a week from today to consider our future course of action, each of us realizing that any decision we take then will determine forever the fate of our Fraternities." He looked around the room. "Thank you, brother Literates," he said.

Instantly, Cardon was on his feet with a motion to recess the meeting until 1300 the following Monday, and Brigade commander Chernov seconded the motion immediately. As soon as Literate President Morehead's gavel banged, Cardon, still on his feet, was running for the double doors at the rear; the two Literates' guards on duty there got them unsealed and opened by the time he had reached them.

There was another guard in the hall, waiting for him with a little record-disk.

"From Major Slater; call came in about ten minutes ago," he said.

Cardon snapped the disk into his recorder-reproducer and put in the ear plug.

"Frank," Slater's voice came out of

the small machine. "You'd better get busy, or you won't have any candidate when the polls open tomorrow. Just got a call from Pelton's store—place infiltrated by goons, estimated strength two hundred, presumed Independent-Conservatives. Serious rioting already going on; I'm taking my reserve company there. And if you haven't found out, yet, where China is, it's on the third floor, next to Glassware."

Cardon pulled out the ear plug, stuffed the recorder into his trouser pocket, and began unbuckling his Sam Browne as he ran for the nearest wall visiphone. He was dialing the guard room on that floor with one hand as he took off the belt.

"Get a big ambulance on the roof, with a Literate medic and orderly-driver," he ordered, unbuttoning his smock. "And four guards, plain clothes if possible, but don't waste time changing clothes if you don't have anybody out of uniform. Heavy-duty sono guns, sleep-gas projectors, gas masks and pistols. Hurry." He threw the smock and belt at the guard. "Here, Pancho; put these away for me. Thanks." He tossed the last word back over his shoulder as he ran for the escalator.

It was three eternal minutes after he had reached the landing stage above before the ambulance arrived, medic and orderly on the front seat and the four guards, all in conservatively cut civilian clothes, inside. He



crowded in beside the medic, told him, "Pelton's store," and snapped the door shut as the big white 'copter began to rise.

They climbed to five thousand feet, and then the driver nosed his vehicle up, cut his propeller and retracted it, and fired his rocket, aiming toward downtown Manhattan. Four minutes later, after the rocket stopped firing and they were on the down-curve of their trajectory, the propeller was erected and they began letting down toward the central landing stage of

Pelton's Purchasers' Paradise. Cardon cut in the TV and began calling the control tower.

"Ambulance, to evacuate Mr. Pelton," he called. "What's the score, down there?"

One of Pelton's traffic-control men appeared on Cardon's screen. "You're safe to land on the central stage, but you'd better come in at a long angle from the north," he said. "We control the north public stage, but the east and south stages are in the hands of the goons; they'd fire on you. Land

beside that big pile of boxes under tarpaulins up here, but be careful; it's fireworks we didn't have time to get into storage."

The ambulance came slanting in from uptown, and Cardon looked around anxiously. The May-fly dance of customers' 'copters had stopped; there was a Sabbath stillness about the big store, at least visually. A few small figures in Literates' guards black leather moved about on the north landing stage, and several Pelton employees were on the central stop stage.

The howling of the 'copter propeller overhead effectively blocked out any sounds that might be coming from the building, at least until the ambulance landed. Then a spatter of firing from below was audible.

Cardon, the medic and the guards piled out, the latter with the stretcher. The orderly-driver got out his tablet pistol and checked the chamber, then settled into a posture of watchful relaxation. Major Slater was waiting for them by one of the vertical lift platforms.

"I tried to get hold of you, but that blasted meeting was going on, and they had the doors sealed, and—" he began.

Cardon hushed him quickly. "Around here, I'm an Illiterate," he warned. "Where's Pelton? We've got to get him and his daughter out of here, at once."

"He's still flat on his back, out cold," Slater said. "The medic you sent around here gave him a shot of hypnotaine; he'll be out for a couple of hours, yet. Prestonby's still here. He's commanding the defense; doing a good job, too."

That was good. Ralph would help get Claire to Literates' Hall, after they'd gotten her father to safety.

"There must be about five hundred Independent-Conservative storm troopers in the store," Slater was saying. "Most of them got here after we did. The city cops have all the street approaches roped off; they're

letting nobody but Grant Hamilton's thugs in."

"They were fairly friendly this morning," Cardon said. "Mayor Jameson must have passed the word." They all got off the lift two floors down, where they found Claire Pelton and Ralph Prestonby waiting. "Hello, Ralph. Claire. What's the situation?"

"We have all the twelfth floor," Prestonby said. "We have about half the eleventh, including the north and west public stages. We have the basement and the storerooms and the warehouse—Sergeant Coccozello's down there, with as many of the store police and Literates and Literates' guards and store-help as he could salvage, and the warehouse gang. They've taken most of the ground floor, the main mezzanine, and parts of the second floor. We moved two of the 7-mm machine guns down from the top, and we control the front street entrance with them and a couple of sono guns. The store's isolated from the outside by the city police, who are allowing reinforcements to come through for the raiders, but we're managing to stop them at the doors."

"Have you called Radical-Socialist headquarters for help?"

"Yes, half a dozen times. There's some fellow named Yingling there, who says that all their storm troops are over in North Jersey, on some kind of a false-alarm riot-call, and can't be contacted."

"So?" Cardon commented gently. "That's too bad, now." Too bad for Horace Yingling and Joe West; this time tomorrow, they'll be a pair of dead traitors, he thought. "Well, we'll have to make do with what we have. Where's Russ Latterman, by the way?"

Prestonby gave a sidewise glance toward Claire and shook his head, his lips pressed tightly together. *She doesn't know, yet*, Cardon interpreted.

"Down in the basement, with Cocozello," Prestonby said, aloud. "We're in telephone communication with Cocozello, and have a freight elevator running between here and the basement. Cocozello says Latterman is using a rifle against the raiders, killing every one he can get a shot at."

Cardon nodded. Probably vindictive about being involved in action injurious to Pelton's commercial interests; just another odd quirk of Literate ethics.

"We'd better get him up here," he said. "You and I have got to leave, at once; we have to get Pelton and Claire to safety. He can help Major Slater till we can get back with re-enforcements. I am going to kill a man named Horace Yingling, and then I'm going to round up the storm troops he diverted on a wild-goose chase to North Jersey." He nodded to the medic and the four plain-clothes guards. "Get Pelton on the stretcher. Better use the canvas flaps and the straps. He's under hypnotaine, but it's likely to be

a rough trip. Claire, get anything you want to take with you. Ralph will take you where you'll be safe for a while."

"But the store —" Claire began.

"Your father has riot-insurance, doesn't he? I know he does; they doubled the premium on him when he came out for Senate. Let the insurance company worry about the store."

The medic and the guards moved into Chester Pelton's private rest room with the stretcher. Claire went to the desk and began picking up odds and ends, including the pistol Cardon had given her, and putting them in her handbag.

"We've got to keep her away from her father, for a few days, Ralph," he told Prestonby softly. "It's all over town that she can read and write. We've got to give him a chance to cool off before he sees her again. Take her to Lancedale. I have everything fixed up; she'll be admitted to the Fraternities this afternoon, and given Literate protection."

Prestonby grabbed his hand impulsively. "Frank! I'll never be able to repay you for this, not if I live to be a thousand—" he began.

There was a sudden blast of sound from overhead—the banging of machine guns, the bark of the store's 20-mm auto-cannon, the howling of airplane jets, and the crash of explosions. Everybody in the room jerked up and stood frozen, then Prestonby jumped for the TV-screen and pawed

at the dials. A moment later, after the screen flashed and went black twice, they were looking across the topside landing stage from a pickup at one corner.

A slim fighter-bomber, with square-tipped, backswept, wings, was jetting up in almost perpendicular flight; another was coming in toward the landing stage, and, as they watched, a flight of rockets leaped forward from under its wings. Cardon saw the orderly-driver of the ambulance jump down and start to run for the open lift-shaft. He got five steps away from his vehicle. Then the rockets came in, and one of them struck the tarpaulin-covered pile of boxes beside the ambulance. There was a flash of multi-colored flame, in which the man and the vehicle he had left both vanished. Immediately, the screen went black.

The fireworks had mostly exploded at the first blast; however, when Cardon and Major Slater and one or two others reached the top landing stage, there were still explosions. A thing the size and shape of a two-gallon kettle, covered with red paper, came rolling toward them, and suddenly let go with a blue-green flash, throwing a column of smoke, in miniature imitation of an A-bomb, into the air. Something about three feet long came whizzing at them on the end of a tail of fire, causing them to fling themselves flat; involuntarily, Cardon's head jerked about and his eyes followed it until it blew up with a flash

and a bang three blocks uptown. Here and there, colored fire flared, small rockets flew about, and firecrackers popped.

The ambulance was gone, blown clear off the roof. The other 'copters on the landing stage were a tangled mass of wreckage. The 20-mm was toppled over; the gunner was dead, and one of the crew, half-dazed, was trying to drag a third man from under the overturned gun. The control tower, with the two 12-mm machine guns, was wrecked. The two 7-mm's that had been left on the top had vanished, along with the machine gunners, in a hole that had been blown in the landing stage.

Cardon, Slater, and the others dashed forward and pulled the autocannon off the injured man, hauling him and his companion over to the lift. The two rakish-winged fighter-bombers were returning, spraying the roof with machine-gun bullets, and behind them came a procession of fifteen big 'copters. They dropped the lift hastily; Slater jumped off when it was still six feet above the floor, and began shouting orders.

"Falk: take ten men and get to the head of this lift-shaft! Burdick, Levine: get as many men as you can in thirty seconds, and get up to the head of the escalator! Diaz: go down and tell Sternberg to bring all his gang up here!"

Cardon caught up a rifle and rummaged for a bandolier of ammunition,

losing about a minute in the search. The delay was fortunate; when he got to the escalators, he was met by a rush of men hurrying down the ascending spiral or jumping over onto the descending one.

"Sono guns!" one of them was shouting. "They have the escalator head covered; you'll get knocked out before you get off the spiral!"

He turned and looked toward the freight lift. It was coming down again, with Falk and his men unconscious on it, knocked senseless by bludgeons of inaudible sound, and a half a dozen of the 'copter-borne raiders, all wearing the white robes and hoods of the Independent-Conservative storm troops. He swung his rifle up and began squeezing the trigger, remembering to first make sure that the fire-control lever was set forward for semiauto, and remembering his advice to Goodkin, that morning. By the time the platform had stopped, all the men in white robes were either dead or wounded, and none of the unconscious Literates' guards along with them had been injured. The medic who had come with Cardon, assisted by a couple of the office force, got the casualties sorted out. There was nothing that could be done about the men who had been sono-stunned; in half an hour or so, they would recover consciousness with no ill effects that a couple of headache tablets wouldn't set right.

The situation, while bad, was not immediately desperate. If the white-

clad raiders controlled the top landing stage, they were pinned down by the firearms and sono guns of the defenders, below, who were in a position to stop anything that came down the escalators or the lift shaft. The fate of the first party was proof of that. And the very magnitude of the riot guaranteed that somebody on the outside, city police, State guards, or even Consolidated States regulars, would be taking a hand shortly. The air attack and 'copter-landing on the roof had been excellent tactics, but it had been a serious policy-blunder. As long as the disturbance had been confined to the interior of the store, the city police could shrug it off as another minor riot on property supposed to be protected by private police, and do nothing about it. The rocket-attack on the top landing stage and the spectacular explosion of the fireworks temporarily stored there, however, was something that simply couldn't be concealed or dismissed. The cloud of varicolored smoke alone must have been visible all over the five original boroughs of the older New York, and there were probably rumors of atom-bombing going around.

"What gets me," Slater, who must have been thinking about the same thing, said to Cardon, "is where they got hold of those two fighter-bombers. That kind of stuff isn't supposed to be in private hands."

"A couple of hundred years ago, they had something they called the

Sullivan Law," Cardon told him. "Private citizens weren't even allowed to own pistols. But the gangsters and hoodlums seemed to be able to get hold of all the pistols they wanted, and burp guns, too. I know of four or five racket gangs in this area that have aircraft like that, based up in the Adirondacks, at secret fields. Anybody who has connections with one of those gangs can order an air attack like this on an hour's notice, if he's able to pay for it. What I can't understand is the Independent-Conservatives doing anything like this. The facts about this business will be all over the state before the polls open tomorrow—" He snapped his fingers suddenly. "Come on; let's have a look at those fellows who came down on the lift!"

There were two dead men in white Independent-Conservative robes and hoods, lying where they had been dragged from the lift platform. Cardon pulled off the hoods and zipped open the white robes. One of the men was a complete stranger; the other, however, was a man he had seen, earlier in the day, at the Manhattan headquarters of the Radical-Socialist Party. One of the Consolidated Illiterates' Organization people; a follower of West and Yingling.

"So that's how it was!" he said, straightening. "Now I get it! Let's go see if any of those wounded goons are in condition to be questioned."

Ray Pelton and Doug Yetsko had

their heads out an open window on the right side of the cab of the 'copter truck; Ray was pointing down.

"That roof, over there, looks like a good place to land," he said. "We can get down the fire escape, and the hatch to the conveyor belt is only half a block away."

Yetsko nodded. There'd be a watchman, or a private cop, in the building on which Ray intended landing. A couple of hundred dollars would take care of him, and they could leave two of Mason's boys with the vehicles to see that he stayed bribed.

"Sure we can get in on the freight conveyor?" he asked. "Maybe it'll be guarded."

"Then we'll have to crawl in through the cable conduit," Ray said. "I've done that, lots of times; so have most of the other guys." He nodded toward the body of the truck, behind, where his dozen-odd 'teen-age recruits were riding. "I've played all over the store, ever since I've been big enough to walk; I must know more about it than anybody but the guy who built it. That's why I said we'd have to bring bullet guns; down where we're going, we'd gas ourselves with gas guns, and if we used sono guns, we'd knock ourselves out with the echo."

"You know, Ray, you'll make a real storm trooper," Yetsko said. "If you manage to stay alive for another ten years, you'll be almost as good a storm troop captain as Captain Prestonby."

That, Ray knew, was about as high



praise as Doug Yetsko could give anybody. He'd have liked to ask Doug more about Captain Prestonby—Doug could never seem to get used to the idea of his officer being a schoolteacher—but there was no time. The 'copter truck was already settling onto the roof.

The watchman proved amenable to reason. He took one look at Yetsko, with three feet of weighted fire hose in his hand, and gulped, then accepted the two C-notes Yetsko gave him. They left a couple of Literates' guards with the vehicles, and Ray led the way to the fire escape, and down into the alley. A few hundred feet away, there was an iron grating which they pulled up. Ray drew the pistol he had gotten out of Captain Prestonby's arms locker and checked the magazine, chamber, and safety, knowing that Yetsko and the other guards were watching him critically, and then started climbing down the ladder.

The conduit was halfway down. Yetsko, climbing behind him, examined it with his flashlight, probably wondering how he was going to fit himself into a hole like that. They climbed down onto the concrete walkway beside the conveyor belts, and in the dim light of the overhead lamps Ray could see that the two broad belts, to and from the store, were empty for as far as he could see in either direction. Normally, there should be things moving constantly in both directions—big wire baskets full of parcels for deliv-

ery, and trash containers, going out, and bales and crates and cases of merchandise, and empty delivery baskets and trash containers coming in. He pointed this out to Yetsko.

"Sure," the big Literates' guards sergeant nodded. "They got control of the opening from the terminal, and they probably got a gang up at the other end, too," he shouted, over the noise of the conveyor belts. "I hope they haven't got into the basement of the store."

"If they have, I know a way to get in," Ray told him. "You'd better stay here for about five minutes, and let me scout ahead. We don't want to run into a big gang of them ahead."

Yetsko shook his head. "No, Ray; the captain told me I was to stick with you. I'll go along with you. And we better take another of these kids, for a runner, in case we have to send word back."

"Ramon, you come with us," Ray said. "The rest of you, stay here for five minutes, and then, if you don't hear from us, follow us."

"Mason, you take over," Yetsko told the guards corporal. "And keep an eye out behind you. We're in a sandwich, here; they're behind us, and in front of us. If anything comes at you from behind, send the kids forward to the next conduit port."

Ray and Yetsko and Ramon No-gales started forward. Halfway to the next conduit port, there was a smear of

lubricating oil on the concrete, and in it, and away from it in the direction of the store, they found footprints. It was Ramon Nogales who noticed the oil on the ladder to the next conduit port.

"You stick here," Yetsko told him, "and when Mason and the others come up, hold them here. Tell Mason to send one of the guards forward, and use the rest of the gang to grab anybody who comes out. Come on, Ray."

At the port beyond, they halted, waiting for Mason's man to come up. They lost some time, thereafter, but they learned that the section of conduit between the two ports was empty and that the main telephone line to the store had been cut. Whoever had cut it had gone, either forward or back away from the store. A little farther on, the sound of shots ahead became audible over the clanking and rattling of the conveyor belts.

"Well, I guess this is where we start crawling," Yetsko said. "Your father's people seem to be holding the store basement against a gang in the conveyor tunnel."

One of the boys scouted ahead, and returned to report that they could reach the next conduit port, but that the section of both conveyor belts ahead of him was stopped, apparently wedged.

Yetsko stood for a moment, grimacing in an effort to reach a decision.

"I'd like to just go forward and hit them from behind," he said. "But I don't know how many of them there

are, and we'd have to be careful, shooting into them, that we didn't shoot up your father's gang, beyond them. I wish—"

"Well, let's go through the conduit, then," Ray said. "We can slide down a branch conduit that runs a power line into the basement. I'll go ahead; everybody at the store knows me, and they don't know you. They might shoot you before they found out you were a friend."

Before Yetsko could object, he started up the ladder, Yetsko behind him and the others following. At the next conduit port, they could hear shooting very plainly, seeming to be in front of them. At the next one, the shooting seemed to be going on directly under them, in the tunnel. With the flashlight Yetsko had passed forward to him, Ray could see that the dust on the concrete floor of the three-foot by three-foot passage between and under the power and telephone cables was undisturbed.

A little farther on, there was an opening on the left, and a power cable branched off downward, at a sharp angle, overhead. Ray was able to turn about and get his feet in front of him; Yetsko had to crawl on until he had passed it, and then back into it after Ray had entered. Bracing one foot on either side, Ray inched his way down the forty-degree slope, hoping that the two hundred pound weight of Doug Yetsko wouldn't start sliding upon him.

Ahead, he could hear voices. He drew his hands and feet away from the sides of the branch conduit and let himself slip, landing in a heap in the electricians' shop, above the furnace rooms. Two men, who had been working at a bench, trying to assemble a mass of equipment into a radio, whirled, snatching weapons. Ray knew both of them—Sam Jacobowitz and George Nyman, who serviced the store's communications equipment. They both stared at him, swearing in amazement.

"All right, Doug!" Ray called out. "We're in! Bring the gang down!"

Frank Cardon and Ralph Prestonby were waiting at the freight-elevator door when it opened and Russell Latterman emerged, a rifle slung over one shoulder. Cardon stepped forward and took the rifle from him.

"Come on over here, Russ," he said. "And don't do anything reckless."

They led him to one side. Latterman looked from one to the other apprehensively, licking his lips.

"It's all right; we're not going to hurt you, Russ," Cardon assured him. "We just want a few facts. Beside rigging that business with Bayne, and almost killing Chet Pelton, and forcing Claire to blow her cover, how much did you have to do with this business?"

"And who put you up to it?" Prestonby wanted to know. "My guess is

Joyner and Graves. Am I right?"

"Graves," Latterman said. "Joyner didn't have anything to do with it; didn't know anything about it. He's in charge of the Retail Merchandising section, and any action like this would be unethical, since Pelton's is a client of the Retail Merchandising section. All Graves told me to do was fix up a situation, using my own judgment, that would provoke a Literate strike and force either Claire or Frank here to betray Literacy. But I had no idea that it would involve a riot like this. If I had, I'd have stood on Literates' ethics and refused to have any part in it."

"That's about how I thought it would be," Cardon nodded. "Graves probably was informed by Literates with the Independent-Conservatives that this riot was planned; he wanted to get our people out of the store. Unfortunately for him, he wasn't present at the extemporaneous meeting that reversed Bayne's action in calling the strike." He handed the rifle back to Latterman. "I just took this in case you might get excited, before I could explain. And you can forget about the Graves-Joyner opposition to Pelton. We had a meeting, right after noon. Lancedale gained the upper hand; Joyner and Graves are co-operating, now; the plan is to support Pelton and get on the inside of the socialized Literacy program, when it's enacted."

"I still think that's a suicidal policy," Latterman said. "But not as

suicidal as splitting the Fraternities and trying to follow two policies simultaneously. I wonder if I could put a call through to Literates' Hall without some of these picture-readers overhearing me."

"You've been out of touch, down in the cellar, Russ," Prestonby told him. "Our telephone line's cut, and the radio is smashed." He told Latterman about the rocket attack on the control tower, which also housed the store's telecast station. "So we're sandwiched, here; one gang has us blocked at the twelfth floor, and another gang's up on the roof, trying to get down at us from above, and we've no way to communicate with the outside. We can pick up the regular telecasts, but nobody outside seems to be paying much attention to us."

"There's a lot of equipment down in the electricians' shop," Latterman said. "Maybe we could rig up a sending set that could contact one of the telecast stations outside."

"That's an idea," Prestonby said. "Let's see what we can do about it."

They went into Pelton's office. The store owner was still lying motionless on his stretcher. Claire was fiddling with a telecast receiving set; she had just tuned out a lecture on Home Beautification and had gotten the mid-section of a serial in which three couples were somewhat confused over just who was married to whom.

"Nobody seems to realize what's

happening to us!" she said, turning the knob again. Then she froze, as Elliot C. Mongery—this time sponsored by Parc, the Miracle Cleanser—appeared on the screen.

". . . And it seems that the attack on Chester Pelton has picked up new complications; somebody seems determined to wipe out the whole Pelton family, because, only ten minutes ago, some twenty armed men invaded the Mineola High School, where Pelton's fifteen-year-old son, Raymond, is a student, and forced their way to the office of Literate First Class Ralph N. Prestonby, in an attempt to kidnap young Pelton. Neither Literate Prestonby, the principal, nor the Pelton boy, who was supposed to be in his office, could be found. The raiders were put to flight by the presence of mind of Literate Martha B. Collins, who pressed the button which turned in the fire alarm, filling the halls with a mob of students. The interlopers fled in panic after being set upon and almost mobbed—"

Prestonby looked worried. "I left Ray in my office, with Doug Yetsko," he said. "I can't understand—"

"Maybe Yetsko got a tip that they were coming and got Ray out of the school," Cardon suggested. "I hope he took him home." He caught himself just in time to avoid mentioning the platoon of Literates' guards at the Pelton home, which he was not supposed to know about. "Don't worry, Claire; if anything'd happened to



Ray, Mongery'd have been screaming about it to high heaven. That's what he's paid to do."

"Well, I'll stake my life on it; if anybody tried to do anything to Ray while Yetsko was with him, you'd have heard about it," Prestonby said. "It'd have been a bigger battle than this one."

"... Can't seem to find out anything about what's going on at Pelton's store," Mongery continued. "Telephone and radio communication seems to be broken, and, although there is

continuous firing going on inside the building, the city police, who have a cordon completely around it, say that the situation in the store is well in hand. Considering Chester Pelton's attacks on the city administration and particularly the police department, I leave to your imagination what they mean by that. We do know that a large body of unidentified plug-uglies whom Police Inspector Cassidy claims are 'special officers' are holding the conveyor line into the store at the downtown Manhattan terminal, and

nobody seems to know what's going on at the other end—"

"They have the sections of both belts at the store entrance end wedged," Latterman said, coming up at the moment. "Coccozello has a barricade thrown up across the store end of the tunnel, and they have a barricade about fifty yards down the tunnel. That's where I was fighting when you called me up."

"Anything being done about gold-berging up a radio sending-set?" Prestonby asked.

"Yes. I just called Coccozello," Latterman said. "Fortunately, the inter-department telephone is still working. He's put a couple of men to work, and thinks he may have a set in operation in about half an hour."

". . . And if, as I much fear, Chester Pelton has been murdered, then I advise all listening to me to go to the polls tomorrow and vote the straight Anarchist ticket. If we've got to have anarchy in this country, let's have anarchy for all, and not just for Grant Hamilton and his political adherents!" Mongery was saying.

There was a series of heavy explosions on the floor above. Everybody grabbed weapons and hurried outside, crowding onto the escalators. The floor above was a shambles, with bodies lying about, and the descending escalator was packed with white-robed attackers, who had apparently prepared for their charge by tossing down a

number of heavy fragmentation bombs. Cardon had a burp gun, this time; he emptied the fifty-shot magazine into the hooded hoodlums who were coming down. Prestonby, beside him, had a heavy sono gun; he kept it trained on the head of the escalator and held the trigger back until it was empty, then slapped in a fresh clip of the small blank cartridges which produced the sound waves that were amplified and altered to stunning vibrations. Still, many of the attackers got through. More were dropping down the lift-platform shaft. Cardon's submachine-gun ceased firing, the action open on an empty clip. He dropped it and yanked the heavy pistol from his shoulder holster. Then, from the direction of the freight elevator, reinforcements arrived, headed by a huge man in the black leather of the Literates' guard, who swung a three-foot length of fire hose with his right hand and fired a pistol with his left, and a boy in a black-and-red jacket who was letting off a burp gun in deliberate, parsimonious, bursts. It was a second or two before Cardon recognized them as Prestonby's bodyguard, Doug Yet-sko, and Claire Pelton's brother Ray. There were four Literates' guards and about a dozen boys with them, all firing with a variety of weapons.

At the same time, others were arriving on the escalators from the floors below, firing as they came off—Slater's Literates' guards, the Literates and their black-jacketed troopers of Hop-

kinson's store service crew, the fifteen survivors of the twenty riflemen from Macy & Gimbel's. The attackers turned and crowded onto the ascending escalator. Most of them got away, the casualties being carried up by the escalator. Doug Yetsko bounded forward and brought his fire hose down on the back of one invader's neck. Then, after a last spatter of upward-aimed shots from the defenders, there was silence.

Cardon stepped forward and yanked the hood from the man whom Yetsko had knocked down, hoping that he had a stunned prisoner who could be interrogated. The man was dead, however, with a broken neck. For a moment, Cardon looked down at the heavy, brutal features of Joe West, the Illiterates' Organization man. If Chester Pelton got out of this mess alive and won the election tomorrow, there was going to have to be a purge in the Radical-Socialist party, and something was going to have to be done about the Consolidated Organization of Illiterates. He turned to Yetsko.

"You and your gang got here just in the nick of time," he said. "How did you get into the store?"

"Through the freight conveyor, into the basement."

"But I thought those goons had both ends of that plugged."

"They did," Yetsko grinned. "But Ray Pelton took us in at the middle, and we crawled through a cable con-

duit to get around the gang at this end."

Cardon looked around quickly, in search of Ray. The boy, having come out of the excitement of battle, was looking around at the litter of dead and wounded on the blood-splashed floor. His eyes widened, and he gulped. Then, carefully setting the safety of his burp gun and slinging it, he went over and leaned against the wall, and was sick.

Prestonby, with Claire Pelton beside him, started toward the white-faced, retching boy. Yetsko put out a hamlike hand to stop them.

"If the kid wants to be sick, let him be sick," he said. "He's got a right to. I was sicker'n that, after my first fight. But he won't do that the next time."

"There isn't going to be any next time!" Claire declared, with maternal protectiveness.

"That's what you think, Miss Claire," Yetsko told her. "That boy's gonna make a great storm trooper," he declared. "Every bit as great as Captain Prestonby, here."

Claire looked up at Prestonby almost worshipfully. "And I never knew anything about your being a fighting-man, till today," she said. "Ralph, there's so much about you that I don't know."

"There'll be plenty of time to find out, now, honey," he told her.

Cardon stepped over the body of

Joe West and went up to them.

"Sorry to intrude on you two," he said, "but we've got to figure on how to get out of here. Could we get out the same way you got in?" he asked Yetsko. "And take Mr. Pelton with us?"

Yetsko frowned. "Part of the way, we gotta crawl through this conduit; it's only about a yard square. And we'd have to go up a ladder, and out a manhole, to get out of the conveyor tunnel. What sorta shape's Mr. Pelton in?"

"He's under hypnotaine, completely unconscious," Prestonby said.

"Then we'd have to drag him," Yetsko said. "Strap him up in a tarp, or load him into a sleeping bag, if we can get hold of one—"

"There are plenty, down in the warehouse," Latterman interrupted, joining them. "And the warehouse is in our hands."

"All right," Cardon decided. "We'll take him out, now, and take him home. I have some men there who'll take care of him. We'll have to get you and Ray out, too," he told Claire. "I think we'll take both of you to Literates' Hall; you'll be absolutely safe there."

"But the store," Claire started to object. "And all these people who came here to help us—"

"As soon as I have your father home, I'm going to start rounding up a gang to raise the siege," Cardon said. "Radical-Socialist storm troops,

and—" He grinned suddenly. "The insurance company; the one that has the store insured against riot! Why didn't I think of them before? They're losing money every second this thing goes on. It'll be worth their while to start doing something to stop it!"

The trip out through the conduit was not so difficult, even with the encumbrance of the unconscious Chester Pelton, but Prestonby was convinced that, except for the giant strength of Doug Yetsko, it would have been nearly impossible. Ray Pelton, recovered from his after-battle nausea and steeled by responsibility, went first. Cardon crawled after him, followed by a couple of the boys. Then came Yetsko, dragging the sleeping bag in which Chester Pelton was packed like a mummy. Prestonby himself followed, pushing on his future father-in-law's feet, and Claire crawled behind, with the rest of Ray's schoolmates for a rearguard.

They got past the battle which was still going on at the entrance to the store basement, letting Pelton down with a rope and carrying him onto the outward-bound belt. They left it in time to assemble under the ladder leading to the alley through which Ray said they had entered, and hauled Pelton up after them. Then, when they were all out in the open again, Ray ran up the alley and mounted a fire escape, and, in a few minutes, a big 'copter truck which had been



parked on the roof let down to them. Into this, Cardon ordered the unconscious senatorial candidate loaded, and the boys who had come with Ray.

"I'll take him home, and then run the boys to the school," he told Prestonby. "You and Ray and Claire get in this other 'copter and go straight to Literates' Hall." He pointed up to the passenger vehicle which was hovering above, waiting for the truck to leave. "Go in the church way, and go straight to Lancedale's office. And here." He scribbled an address and a phone number and a couple of names. "These men have my 'copter at this address. Call them as soon as you get to Literates' Hall and have them take it at once to Pelton's home, on Long Island."

Prestonby nodded and watched Cardon climb into the truck. The Literates' guard who was driving lifted it up and began windmilling away toward the east. The passenger 'copter, driven by another guard from the school, settled down. Putting Ray and Claire into it, he climbed in after them.

"Ray," he said, "how would you like to be a real white-smock Literate?"

Ray's eyes opened. "You think I'm good enough?"

"Good enough to be a novice, to start with. And I don't think you'll stay a novice long."

Claire looked at him inquiringly, saying nothing.

"You, too, honey," he said. "Frank fixed it all up. You and Ray will be admitted to the Fraternities, this afternoon. And that will remove any objection to our being married."

"But . . . how about the Senator?" she asked.

Prestonby shrugged. "It's all over the state now that you can read; there's nothing that you can do about it. And Frank has a lot of influence with him; he'll talk him around to where he'll be willing to make the best of it, in a week or so."

Russell Latterman noticed that Major Slater was looking at him in a respectfully inquiring manner. He said nothing, and, at length, the Literates' guards officer broke the silence.

"You didn't go out with the others."

Latterman shook his head. "No, major; I'm an executive of Pelton's Purchasers' Paradise, however unlike its name it may look at the moment. My job's here. I'm afraid I'll have to lean pretty heavily on you, until Mr. Cardon can get help to us. I'm not particularly used to combat."

"You've been doing all right with that rifle," Slater told him.

"I can hit what I aim at, yes. But I'm not used to commanding men in combat, and I'm not much of a tactician."

Slater thrust out his hand impulsively. "I took a sort of poor view of

you, at first. I'm sorry," he said. "Want me to take command?"

"If you please, major."

"What are you going to do, after this thing's over?" Slater asked.

"Stay on with Pelton's, provided Mr. P. doesn't find out that I organized that trick with his medicine and the safe," Latterman said. "Since Lancedale seems to have gotten on top at the Hall, I am, as of now, a Lancedale partisan. That's partly opportunism, and it's partly because, since a single policy has been adopted, I feel obliged to go along with it. I'll have to get the store back in operation, as soon as possible. Pelton's going to need money, badly, if he's going to try for the presidency in '44." He looked around him. "You know, I've always wanted to run a fire sale; this'll be even better—a battle sale!"

Cardon watched Chester Pelton apprehensively as the bald-headed merchant and senatorial candidate sipped from the tall glass in his hand and then set it on the table beside him. His face was pale, and he had the look of a man who has just been hit with a blackjack.

"That's an awful load of bricks to dump on a man, all at once, Frank," he said reproachfully.

"You'd rather I told you, now, than turn on the TV and hear some commentator talking about it, wouldn't you?" Cardon asked.

Pelton swore vilely, in a lifeless monotone, cursing Literacy, and all

Literates back to the invention of the alphabet. Then he stopped short.

"No, Frank, I don't mean that, either. My own son and daughter are Literates; I can't say that about them. But how long—?"

"Oh, for about a year, I'd say. I understand, now, that they were admitted to the Fraternities six months ago," he invented.

"And they were working against me, all that time?" Pelton demanded.

Cardon shook his head. "No, Chet; they were for you, all the way. Your daughter exposed her Literacy to save your life. Your son and his teacher came to your store and fought for you. But there are Literates who want to see you defeated, and they're the ones who made that audio-visual, secretly, of the ceremony in which your son and daughter took the Literates' Oath and received the white smock, and they're going to telecast it this evening at twenty-one hundred. Coming on top of the stories that have been going around all afternoon, and Slade Gardner's speech, this morning, they think that'll be enough to defeat you."

"Well, don't you?" Pelton gloomed. "My own kids, Literates!" He seemed to have reached a point at which he was actually getting a masochistic pleasure out of turning the dagger in his wounds. "Who'd trust me, after this?"

"No, Chet; it isn't enough to beat you—if you just throw away that crying towel and start fighting. They

made one mistake that's going to wreck them."

"What's that, Frank?" Pelton brightened, by about one angstrom unit.

"The timing, of course!" Cardon told him, impatiently. "I thought you'd see that, at once. This telecast comes on at twenty-one hundred. Your final speech comes on at twenty-one thirty. As soon as they've shown this business of Claire and Ray taking the Literate Oath, you'll be on the air, yourself, and if you put on any kind of a show worth the name, it won't be safe for anybody in this state to be caught wearing a white smock. Now, if they'd only had the wit to wait till after you'd delivered that speech you've been practicing on for the last two weeks, and then spring this on you, that would have been different. They'd have had you over a barrel. But this way, you have them!"

Pelton took another gulp from the tall glass at his elbow, emptying it. "Fix me up another of these, Frank," he said. "I feel like a new man, already." Then his face clouded again. "But we have no time to prepare a speech, now, and I just can't ad lib one."

Cardon drew a little half-inch record-disk from his pocket case.

"Play this off," he said. "I had it fixed up, as soon as I got wise to what was going to happen. The voice is one of the girls in my office, over at the brewery. Pronunciation, grammar, elocution and everything correct."

Pelton snapped the disk onto his recorder and put in the ear plug. Then, before he pressed the stud, he looked at Cardon curiously.

"How'd you get onto this, anyhow, Frank?" he wanted to know.

"Well . . . I hope you don't ask me for an accounting of all the money I've been spending in this campaign, because some of the items would look funny as hell, but—"

"No accounting, Frank. After all, you spent as much of your own money as you did of mine," Pelton interrupted.

". . . But I bought myself a pipe line into Literates' Hall big enough to chase an elephant through," Cardon went on, ignoring the interruption. "This fellow Mongery, for instance." Elliot Mongery was one of Literate Frank Cardon's best friends; he comforted his conscience with the knowledge that Mongery would slander him just as unscrupulously, if the interests of the Lancedale Plan were at stake. "I have Mongery just like this." He made a clutching and lifting gesture, as though he were picking up some small animal by the scruff of the neck. "So, as soon as I got word of it, I started getting this thing together. It isn't the kind of a job a Literate semanticist would do, but it's all honest Illiterate thinking, in Illiterate language. Turn it on, and tell me what you think of it."

While Pelton listened to the record,

Cardon mixed him another of the highballs, adding a little of the heart-stimulant the medic had given him. Pelton was grinning savagely when he turned off the little machine and took out the ear plug.

"Great stuff, Frank! And I won't have to ham it much; it's just about the way I feel." He thought for a moment. "You have me talking about my ruined store, there. Just how bad is it, anyhow?"

"Pretty bad, Chet. Latterman says it's going to take some time to get it fixed up, but he expects to be open for business by Thursday or Friday. He's going to put on a big Battle Sale; he says it's going to make retail-merchandising history. And the insurance covers most of the damage."

"Well, tell me about it. How did you get the riot stopped, after you got me out? And how did you—?"

Cardon shook his head. "You play that record over again; get yourself in the mood. When you go on, we'll have you in a chair, wrapped in a blanket . . . you're supposed to have crawled back out of the Valley of the Shadow of Death to make this speech . . . and we'll have the wire run down inside the blanket, so that you can listen to the speech while you're giving it. Chet, this is going to be one of the great political speeches of all time—"

Literate William R. Lancedale looked up from his desk and greeted his visitor with a smile.

"Well, Frank! Sit down and accept congratulations! I suppose you got the returns?"

Cardon nodded, dropping into a chair beside the desk. "Just came from campaign headquarters. This automatic tally system they use on the voting machines is really something. Complete returns tabulated and reported for the whole state within forty minutes after the polls closed. I won't be silly enough to ask you if you got the returns."

"I deserved that, of course," Lancedale chuckled. "Can I offer you refreshment? A nice big stein of Cardon's Black Bottle, for instance?"

Cardon shuddered and grimaced horribly. "I've been drinking that slop by the bucketful, all day. And Pelton's throwing a victory party, tonight, and I'll have to choke down another half gallon of it. Give me a cup of coffee, and one of those good cigars of yours."

Lancedale grinned at him. "Ah, yes, the jolly brewer. His own best advertisement. How's Pelton reacting to his triumph? And what's his attitude toward his children? I've been worrying about that; vestigial traces of a conscience, I suppose."

"Well, I had to keep him steamed up, till after he went off the air," Cardon said. "Chet isn't a very good actor. But after that, I talked to him like a Dutch uncle. Told him what a swell pair of kids and a fine son-in-law he had. He got sore at me. Tried to

throw me out of the house, a couple of times. I was afraid he was going to have another of those attacks. But by the time Ralph and Claire get back from their honeymoon and Ray finishes that cram-course for Literate prep school, he'll be ready to confer the paternal blessing all around. I'm going to stay in town and make sure of it, and then I'm taking about a month's vacation."

"You've earned it, all right." Lancedale poured Cardon's coffee and passed him the cigar humidor. "How's Pelton's attitude toward the Consolidated Illiterates' Organization, now?"

Cardon, having picked up the Italian stiletto to puncture his cigar, looked at it carefully to make sure that it really had no edge, and then drew it quickly across his throat.

"Just like that. You know what really happened, yesterday afternoon, at the store, don't you?"

"Well, in general, yes. I wish you'd fill me in on some of the details, though, Frank."

"Details he wants. Well." Cardon blew on his coffee and sipped it. "The way we played it for propaganda purposes, of course, there was only one big riot, and it was all the work of the wicked Literates and their Independent-Conservative hirelings. Actually, there were two riots. First, there was one the Independents had planned for about a week in advance; that was the one Sforza tipped us on, the one

that started in China. Graves knew about it, enough to advise Latterman to get all the Literates out of the store before noon, which Latterman did, with trimmings.

"Then, there was another riot, mas-termined by a couple of Illiterates' Organization Action Committee people named Joe West and Horace Yingling, both deceased. That was the result of Latterman's bright idea to trap Claire and/or me into betraying Literacy. These Illiterate fanatics made up their minds, to speak rather loosely, that the whole Pelton family were Literates, including Chet himself. They decided that it was better to kill off their candidate and use him for a martyr two years from now than to elect him and have him sell them out. They got about a hundred or so of their goons dressed in Independent-Conservative KKK costumes, bought air support from Patsy Callazo's mob, up in Vermont, and made that attack on the top landing stage, after starting a fake riot in North Jersey, to draw off the regular Radical-Socialist storm troops. Incidentally, when I found out it was Callazo's gang that furnished those fighter bombers, I hired another mob to go up and drop a block-buster on Callazo's field, to teach him to keep his schnozzle out of politics."

Lancedale nodded briskly. "That I approve of. How about West and Yingling?"

"Prestonby's muscle man, Yetsko,

killed West. I took care of Comrade Yingling, myself, after I'd gotten reinforcements to the store—first a couple of free-lance storm troops that the insurance company hired, and then as many of the Radical Rangers as I could gather up.”

“And Pelton knows about all this?”

“He certainly does! After this caper, the Illiterates’ Organization’s through, as far as any consideration or patronage from the Radicals is concerned.”

“Well, that’s pretty nearly the best thing I’ve heard out of the whole business,” Lancedale said. “In about eight or ten years, we may want to pull the Independent-Conservative party together again, to cash in on public dissatisfaction with Pelton’s socialized Literacy program, which ought to be coming apart at the seams by then. And if we have the Illiterates split into two hostile factions—”

Cardon finished his coffee. “Well, chief, I’ve got to be getting along. O’Reilly can only cover me for a short while, and I have to be getting to this victory party of Pelton’s—”

Lancedale rose and shook hands with him. “I can’t tell you, too many times, what a fine job you did, Frank,” he said. “I hope . . . no, knowing you, I’m positive . . . that you’ll be able to engineer a reconciliation between Pelton and his son and daughter and young Prestonby. And then, have yourself a good vacation.”

“I mean to. I’m going deer hunting,

to a place up in the mountains, along the old Pennsylvania-New York state line. A little community of about a thousand people, where everybody, men, women and children, can read.”

Lancedale was interested. “A community of Literates?”

Cardon shook his head. “Not Literates-with-a-big-L; just people who can read and write,” he replied. “It’s a kind of back-eddy sort of place, and I imagine, a couple of hundred years ago, the community was too poor to support one of these ‘progressive’ school systems that made Illiterates out of the people in the cities. Probably couldn’t raise enough money in school taxes to buy all the expensive audio-visual equipment, so they had to use old-fashioned textbooks, and teach the children to read from them. They have radios, and TV, of course, but they also have a little daily paper, and they have a community library.”

Lancedale was thoughtful, for a moment. “You know, Frank, there must be quite a few little enclaves of lower-case-literacy like that, in backwoods and mountain communities, especially in the west and the south. I’m going to make a project of finding such communities, helping them, and getting recruits from them. They’ll fit into the Plan. Well, I’ll be seeing you some time tomorrow, I suppose?”

He watched Cardon go out, and then poured a glass of port for himself and sipped slowly, holding the glass to

the light and watching the ruby glow it cast on the desk top. It had been over thirty years ago, when he had been old Jules de Chambord's assistant, that the Plan had been first conceived. De Chambord was dead these twenty years, and he had taken the old man's place, and they had only made the first step. Things would move faster, now, but he would still die before the Plan was completed, and Frank Cardon, whom he had marked as his successor, would be an old man, and somebody like young Ray Pelton would be ready to replace him, but the Plan would go on, until everybody would be literate, not Literate, and illiteracy, not Illiteracy, would be a mark of social stigma, and most people would live their whole lives without personal acquaintance with an illiterate.

There were a few years, yet, to prepare for the next step. The white smocks would have to go; Literates would have to sacrifice their paltry titles and distinctions. There would have to be a re-constitution of the Fraternities. Wilton Joyner and Harvey Graves and the other Conservative Literates would have to be convinced, emotionally as well as intellectually, of the need for change. There were a few of the older brothers who could never adjust their thinking; they would have to be promoted to positions with higher salaries and more impressive titles and no authority whatever.

But that was all a matter of tactics; the younger men, like Frank Cardon and Elliot Mongery and Ralph Prestonby, could take care of that. Certain changes would occur: A stable and peaceful order of society, for one thing. A rule of law, and the liquidation of these goon gangs and storm troops and private armies. If a beginning at that were made tomorrow, using the battle at Pelton's store to mobilize public opinion, it would still take two decades to get anything really significant done. And a renaissance of technological and scientific progress— Today, the manufacturers changed the 'copter models twice a year—and, except for altering the shape of a few chromium-plated excrescences or changing the contours slightly, they were the same 'copters that had been buzzing over the country at the time of the Third World War. Every month, the pharmaceutical companies announced a new wonder drug—and if it wasn't sulfa, it was penicillin, and if it wasn't penicillin it would be aureomycin. Why, most of the scientific research was being carried on by a few Literates in the basements of a few libraries, re-discovering the science of two centuries ago.

He sighed, and finished his port, and, as he did probably once every six months, he re-filled the glass. He'd be seventy-two next birthday. Maybe he'd live long enough to see—

THE END



# THE REFERENCE SHELF

BY P. SCHUYLER MILLER

## PRIMERS FOR SPACEMEN

Little by little the idea is getting around that these science-fiction fans aren't completely nuts. There is resistance, I grant you—mainly on the part of schoolteachers, librarians, and it appears department store booksellers. (At least, the book department of one of Pittsburgh's largest stores insists that Viking's new super-picture-book belongs in the juvenile department, where I finally ran it down after hunting among the adult books.)

But the publishers are doing their share, no matter what the booksellers and librarians may do to their wares. Science fiction and good background

books are appearing steadily, Arthur Clarke's "Exploration of Space" was a Book-of-the-Month—wonder how many members selected it?—and even TV hires Willy Ley as a consultant.

There are in your bookstores as I write, around Thanksgiving time, three reasonably new books which should give young and old a thorough grounding in one phase of science fiction—the near-future phase having to do with rocket flight to the Moon and planets. Two are ostensibly for children; the third, as I said above, seems to confuse booksellers.

You must remember the book buy of 1951, Jack Coggins' and Fletcher Pratt's gorgeous little "Rockets, Jets,



Guided Missiles and Space Ships" which Random House produced for one and only one buck. Here, with a simple but far from written-down text, the "poor man's Bonestell" brought the basic facts of rocketry to life in graphic, lively pictures. Now the same pair have gone a trifle more specific in another Random House bargain, "By Space Ship to the Moon"—fifty-eight pages; a picture to a page, more or less; lots of color—and still just one dollar! This isn't quite as striking a book as last year's, but any serious youngster should grab at it and you'll have a job getting it back for your own collection. One sour note in a text that's a little simpler than in "Rockets, Jets, et cetera." Clarke, among others, has pointed out that you'll be weightless as long as you're in a free-fall orbit, no matter how close you are to the Moon or any other source of gravitational attraction.

This and the other two books I want to call to your attention are primers of space travel—almost "how to" books, if you have your own four billion to spend and a well equipped basement workshop the size of White Sands crossed with Willow Run. Step by step, bringing in the newest of the new ideas, Messrs. Coggins and Pratt take their young readers and old up to build an orbital station—theirs is more compact than the Von Braun model which we'll discuss in a moment—assemble a spider-legged Moon ship, and start setting up an under-

ground lunar base. They come up with all sorts of fascinating little suggestions—the possible tendency of potatoes to run to leaves, for example, under reduced gravity.

Though not as handsomely illustrated, the most straightforward and comprehensive discussion of space travel for youngsters that I have seen yet is Hal Goodwin's "The Real Book About Space Travel"—Garden City Books, New York. 192 pp. Ill. \$1.25—one of a growing series of "Real" books—people, animals, sports, music, magic, stars—from another very knowledgeable publisher. This can certainly be read down in the grades—I suspect by a good many of those walking, squirming, bouncing, insatiable curiosities who go by the name of Fourth Graders, as well as by their alleged betters in higher grades. I hope it will go home from school and from the library, and that parents will pick it up—it's by no means too difficult for them—and it may even be that an occasional teen-ager will sneak off with it, where none of his pals will know he is reading a book with such large type and short sentences—almost as short as their comics—and have a wonderful time.

Again it's a primer treatment—step-by-step—every detail spelled out *and reasoned out* in the clearest of terms. Hal Goodwin draws liberally on the contemporary books, all the way from Charles Fort to the original Coggins-Pratt masterpiece, Clarke, Ley and

"Space Medicine," and gives credit where it is due. The illustrations by Clifford Geary—black-and-whites except for a striking jacket—are simple and to the point. The whole story is there—Newton's laws, qualifications of a real Spaceman First Class, escape velocity, the space station, conditions on the planets and their satellites.

I especially recommend the book to grade-school teachers—young ones, too—who will find in it a prime example of how to turn the unreal side of science-fiction comics and television into interest in real science. (Since I carped at Fletcher Pratt over that one about the Moon's gravitational field, I'll have to dig at Author Goodwin for insisting that the take-off of a Moon ship will disturb the space station's orbit. He's just finished pointing out that a rocket is a closed system which doesn't kick against its surroundings. The Pratt-Coggins team go into this explicitly, by the way.)

The big book, the super-book, the one you probably all have by now anyway, is the new Viking Press-Chesley Bonestell picture book, "Across the Space Frontier" (Viking Press, New York. 147 pp. \$3.95). This is not another must of the quality of the Ley-Bonestell-Viking "Conquest of Space"—books like "Conquest" just don't happen twice in two years. What it is is another primer—this time for adults.

Specifically, "Across the Space Fron-

tier" is a blowup of the symposium on space travel to which *Collier's* magazine devoted its entire issue of March 22, 1952. That is, the text is expanded into a minutely detailed discussion of every phase of rocket flight to the planets and the stars: although I don't have the magazine handy for comparison, and the book is very nearly as big—and a lot thicker—my recollection is that it doesn't have all the illustrations of the original.

I have another gripe, and may as well get it off now. At just about the time the book was scheduled to appear, *Collier's* ran a second symposium with about the same cast, going into equally fine detail on a first trip to the Moon. This took up parts of its October 18th and October 25, 1952 issues, with Bonestell color illustrations of course. And why *Collier's* and Viking didn't wait to add this Moon material to "Across the Space Frontier"—especially Chesley Bonestell's breathtaking panorama of *Sinus Roris* from the second installment—I'll never know. Unless, of course, there's still a third book coming.

Physically this book hasn't been produced with the loving care of "Conquest of Space," but it's still beautifully done. Rolf Klep, in color, and Fred Freeman, with a cut-open view of the space station, have abetted Bonestell and their work, on the whole, comes off better than his in the matte-paper reproductions. Mars from Deimos is here about as unsightly brick-

red as the globe I have been trying to make.

The book is notable as an adult primer primarily because in it Wernher von Braun, co-designer of the original V-2 and now technical director of our Army Ordnance Guided Missile Development Group at Redstone Arsenal, spells out his concept of the space station—a huge bicycle wheel of metal and plastic hung in the two-hour orbit, one thousand seventy-five miles above the Earth—and expresses his conviction that ten years and four billion dollars will hang it there. Sixty pages—more than a third of the book—are in his “Prelude to Space Travel.” Dr. Joseph Kaplan, professor of physics at U.C.L.A., sets the stage with a short historic introduction and explanation of what space is, then turns the ball over to von Braun. He is followed by Dr. Heinz Haber, once of the Department of Space Medicine and now teaching astrophysics at U.C.L.A., who expands on the question, “Can We Survive In Space?” Willy Ley describes the space station, and Oscar Schachter, deputy director of the United Nations legal department, has a very interesting short section on “Who Owns the Universe?” Dr. Fred L. Whipple, well known Harvard astronomer, closes the symposium in a section entitled “The Heavens Open” in which he discusses the scientific reasons for wanting a space station.

“Across the Space Frontier” is an adult primer of the space station—the

step in Man’s conquest of space which is within reach, here and now, in the opinion of these experts. The problems of erecting such a station are probably the best worked-out of any phase of space flight. The calm matter-of-factness of von Braun’s statement completely throws away the emotional aspects of which we are all very much aware. It’s as simple as climbing a mountain—one up which there’s a well engineered motor road.

You may have good reasons for preferring other forms of space station to von Braun’s bicycle wheel—Hal Goodwin describes some of the alternatives in “The Real Book About Space Travel”—but there will be less disagreement about it than about his ten-ship Mars expedition, here mentioned in passing but widely publicized in the press and perhaps reserved for that third *Collier’s*-Viking book. And of course the book will take its place on the reference shelf of most science fiction writers.

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**INDEX TO THE SCIENCE FICTION MAGAZINES: 1926–1950** compiled and arranged by Donald B. Day. Perri Press, Portland, Oregon. 1952. 184 pp. \$6.50.

This index to nearly thirteen hundred science-fiction and fantasy magazines, arranged by author and title and with a running checklist of the magazine issues covered, will now cost you \$6.50 instead of the \$5.00 you would have paid if you’d ordered it when we

first announced it here last spring. To anyone with a large magazine collection, it is a must item whose principal shortcoming is the unavoidable absence of *Weird Tales*.

The book, its compiler says with a good deal of understatement, "is primarily a labor of love." Files of the fifty-eight magazine titles covered—British and American—were reduced to some twenty thousand cross-indexed title and author cards. Seventeen years of work have gone into that. Verifiable information as to pen names was added. Somewhere in the interim—it must be assumed that he also earns a living—Don Day also found time to edit "The Fanscient" and serve as chairman of the Norwescon.

You may find errors in what is a tool comparable to the Bleiler-Dikty "Checklist": if you do, pass them on to the publisher. This does not include minor typographical errors, over which he is now cursing as busily as anyone. It should not include snide remarks about using offset lithography instead of some more expensive forms of reproduction which would have made the whole project impossible.

Here are some of the unexpected extra values you'll find: lists of most of the special series, such as Dr. E. E. Smith's "Skylark," "Lensman," and "Vortex Blaster" tales, or George O. Smith's "Venus Equilateral" yarns. Lists of the work of cover artists, where they were identified. Editors of various magazine departments. Size,

number of pages, and cover artist for each issue of each magazine. And a durable cover and binding which will prolong the usefulness of the book for a long, long time after its price among rare book dealers has gone far beyond the present cost.

With this vast job out of the way, who will help Don Day with a supplement which *will* include *Weird Tales*, or any other fantasy he may have omitted—since these magazines usually contained some science-fiction in the early days—and an index to the Munsey, Street & Smith, and Gernsback magazines—that is, to the fantasy in them?

---

**FIVE SCIENCE FICTION NOVELS**, edited by Martin Greenberg. Gnome Press, New York. 1952. 382 pp. \$3.50.

August Derleth has not been afraid to include long novelettes, or even novel-length stories, in his anthologies, but it has been the custom for other editors to keep to the shorter lengths. These longer stories are, therefore, among the few sources of science fiction which have not been completely picked over. Two collections, offering them as "novels," are now available and others will undoubtedly be forthcoming.

The five science-fiction novels of Martin Greenberg's latest collection are Norvell W. Page's story of the struggle against a superman, "But

Without Horns"; Fritz Leiber's strange tale of three interlocking worlds, "Destiny Times Three"; Norman L. Knight's story of an undersea race, "Crisis in Utopia"; A. E. van Vogt's "The Chronicler," in which a man with three eyes is enabled to take a hand in wars in another plane, and Jack Williamson's relatively short account of the discovery of a super-power source on Mars, "The Crucible of Power." All five stories were first published here or in *Unknown Worlds* between 1939 and 1946, and, frankly, they are dated.

This is probably an unfair judgment of "Destiny Times Three," because this story of the dreams which became reality and the three Thorns switched among three alternative time-tracks would be as acceptable today as it was seven years ago. "Crisis in Utopia," with its wholly likable race of Tritons, has the standard paranoid villain of those days when such characters were busily making world history. The mutant John Miller of "But Without Horns" never appears in person in that completely unbelievable scuffle with the FBI, but he is also typical of the times.

"The Chronicler" is pretty good van Vogt, and very much like "Destiny Times Three." In the Leiber story, Thorn was enabled to move from world to world by use of a mysterious stone, functioning at times of mental crisis. Michael Slade of "The Chronicler" does about the same, in

about the same way, with his combination of three eyes. There are pleasantly grizzly van Vogtian touches throughout the tale—the furry telepathic *nith*, the invisible fauna, and if you like the blood-drinkers of the besieged city of Naze. But here is another variation of the van Vogt concept of a man who undergoes lifelong preparation, unknown to himself, for the role he must play in a crisis in some tangled mass of plot and counter-plot.

"Crucible of Power" is completely minor Williamson, giving the collection a not-too-high score: one very good story, two pretty good, two rather dismal. The collection isn't up to the Greenberg standard, set in his first "theme" anthologies.

---

**GREEN FIRE**, by John Taine. Fantasy Publishing Company, Inc., Los Angeles. 1952. 313 pp. \$3.00.

While Fantasy Press gives us John Taine's magazine items between hard covers, F.P.C.I. has embarked on the equally worthy project of getting back into print the mathematician-author's hard-to-find science-fiction books.

"Green Fire" is the one book in the Taine library which ran close enough to general public taste in its time (1928) so that it was dramatized and presumably produced. It belongs to the earlier and less well known cycle—judging from nominations in the recent "Reference Library" poll—which

includes "Quayle's Invention" and "The Gold Tooth," and by the same token has a far less complicated and more straightforward plot than the author's later books.

Set in the year 1990, this is a Tainian variation on the mad scientist theme, and as such straight physics without the preoccupation with the mystery and variability of the life-force which seems to be characteristic of the author's later books. Boris Jevic, the mathematical genius whose Consolidated Power rules most of the world, is racing for the release and control of atomic energy with one of the few remaining groups of scientific hold-outs, Dr. James Ferguson and his associates in Independent Laboratories. Jevic is utterly ruthless, determined to make mankind pay for its failure to recognize him when he came to America as a penniless genius. Ferguson fears what Jevic may unleash and be unable to control.

As usual, the book opens with a series of mysteries—a flash of green light that oddly paralyzes its victims—a growing irritability among metal workers—strange lines in the spectrum of the farthest nebulae. As usual, the author's spokesmen have some biting comments to make about the foibles of their fellow men. And as usual, as the scientific slugging match between Jevic and Ferguson's champion, red-headed David MacRobert, gets underway, the action builds up a climax which would tax the abilities

of Cecil B. de Mille and the entire Technicolor staff. Not, mind you, that it wouldn't be nice to have them try their hand at it.

The science and the style of "Green Fire" seem more dated than John Taine's other books. Perhaps he should have taken time to rewrite it as, in his proper person as Dr. Eric Temple Bell, he revises his mathematical essays. But if any of the "classics" of the 1920s are worth resurrecting, John Taine's are, and F.P.C.I. deserves a vote of thanks for following its reprint of "The Iron Star" with "Green Fire." "The Greatest Adventure" would be my nomination for the next to come.

---

**GUNNER CADE**, by Cyril Judd. Simon and Schuster, New York. 1952. 218 pp. \$2.75.

The ink was hardly dry on the last installment of "Gunner Cade" before Simon and Schuster had it out between hard covers. This record has, I think, been beaten only by Robert A. Heinlein's "Puppet Masters," which was out in book form *before* the magazine which serialized it had time to print the last installment.

There is no point in going over again for the benefit of ASF readers the plot of this story of Gunner Cade, the intelligent but deeply indoctrinated mercenary soldier of the future who was jockeyed into a position where he had to think and act for himself. When two

such expert writers as Cyril Kornbluth and Judith Merrill combine forces, all that can possibly result is top-notch story-telling, and that's what "Cyril Judd" has given us and presumably will give us.

You liked it here in these pages: well, pulp paper turns brittle with the years, no matter how tenderly you cherish it, and unless you plan to put your collection on microfilm and keep

it in a humidor, you'd better get the hard-shell book and put it on the shelf. Next poll someone holds, ten or twenty years from now, you'll want the book around just to see if it was as good as you remembered. It is—so you'll find the book missing. There is no more sincere token of appreciation than the borrowing—and keeping—of someone else's book.

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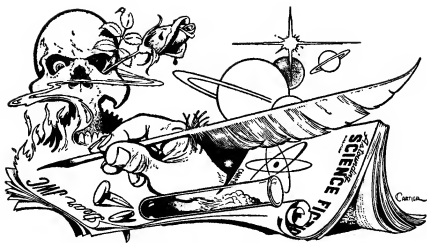
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## BRASS TACKS

Dear Mr. Campbell:

If you have space, I would like to put forward a few, perhaps new, ideas on the sociology-physical science wrangle which starts whenever there is an opportunity.

The difficulty usually starts with somebody saying, or implying, that the "nonscientific" social sciences are lagging behind the vast store of knowledge gathered by the "scientific" physical sciences, and proving the point by pointing to the accomplishment of the atomic bomb as compared with the societal mess the present world faces.

Please make the following observations: 1. Complete understanding of atomic bombs does not mean they will be built, somebody has to want one. 2. Human society operates in a vacuum, any force generated within it reacts there. It has to, the words are all inclusive. 3. Scientists, any kind, and Sociologists, any kind, are interacting parts of human society. 4. Progress and success are relative terms, and have meaning only in relation to Motive, Process, and Goal.

Having observed, identify: A "scientist" is a man who observes and describes natural phenomena; no scien-



tist has yet explained any phenomenon except in terms of description. A "sociologist" is a man who observes and describes social phenomena; no sociologist has yet explained any social phenomenon except in terms of description. The technicians of these arts have other names, thus: Inventor, Repairman, Operator-Philosopher, muckraker, politician, et cetera. A politician is no more a "sociologist" than a comptometer operator is a "scientist." Every day, both make use of sound and workable principles developed and tested over long periods of time. In both cases, success may depend on skill rather than knowledge.

It seems to me that the process by which societies form, the factors which perpetuate them, and the causes of their growth and decline have been thoroughly and clearly described. The social technicians use this information every day to control and direct society. Lack of "success," depends on how we define it. Within the scope of their objectives, the New Dealers have been highly successful. The kicker in the world peace problem is not the knowledge or skill available, it is in the motives of the skilled operators available.

If there is any comparison between social and physical science accomplishments, it would be this: The physical science boys have learned so much that their technicians can destroy everything; the social science boys have learned so much that their tech-

## For your basic S-F library

We are happy to note that this magazine has helped confirm an immodest feeling we've always had—that Simon and Schuster publishes some pretty good science fiction.

In the January, 1953, issue of *ASF*, P. Schuyler Miller reported on a survey of readers, editors, writers, and the like, and listed 28 *must* books: "The Basic Science Fiction Library"—books to have and to hold, come what may. No less than *four* of the ten titles we've published so far made the grade.

Special honors go to A. E. van Vogt: his classic *SLAN* is No. 2 on this list and he is the only modern writer to break into a listing of most notable "old masters" of all time.

Our basic books are all in print, waiting to fill any gaps on your personal s-f bookshelf. In the order of their appearance on the list, they are:

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nicians can convince most of us that everything ought to be destroyed.

You mentioned that Sociologists frequently cry for research money, and it is indeed silly of them. There is, in every large town, an organization, which, by the use of well understood and tested advertising principles—developed by sociologists—will raise money for any legal purpose. All you give them is a reason and a cut of the take; they make the plea look plausible, honorable, and vital. They can get the money because they are skilled social technicians.

If there is a fundamental difference between social and physical scientific activities, it is this: The scientist is interested in result, the sociologist is interested in process. Give your chemist an order for a certain compound and he, knowing all the ingredients and all their interactions, will produce it for you. He does not care, in fact he regards it as natural, that there may be heat, even an explosion, before he reaches the desired compound. The practicing social technician sometimes can, more often cannot, afford explosions in his processes. Skill, not basic knowledge, has almost invariably made the difference for both parties. Little Willie, scientific experimenter, picked up the wrong glass. Adolph Hitler made a mistake in judging quantitative opposition.

The nature of their work being what it is, the skilled scientist technician usually works for the skilled

social technician, and the theorists of both parties generally starve. Can there be any question of relative success while motives are in question? I think not.

If the social scientist needs to win a war to advance his idea, his scientist employees invent the weapon, and by successful use of it his military employees win. All are equally successful.

If the social scientist wishes to establish an homogenous, self-perpetuating, equitable and productive society, one which will be universal and permit a maximum of effort to be channeled profitably, and a minimum of effort to be channeled into the operation of the societal structure, and if the goal of the physical scientist is to give man the ability to understand and profit by every facet of the natural world, to free man from want, of all kinds, and his tiny planet, to give him the opportunity to explore and understand his universe, then both are equally distant from their respective goals. It may just be that neither can succeed without the other, or that the success of either will mean the rapid success of the other.

The motives of our present sociologists and scientists are various, their levels are similar. Let's hope they don't blow up the lab before they learn that purpose is more important than technique. After all, there is only one sociology lab, and we are all in it. That is something no one can deny.  
—David G. Hunt.

*A statement of the situation that's worth considering. I'd raise only two points: The Ironmasters of the old days were not technicians in the modern sense; like politicians, they had rules of thumb rather than theory. Second: If the lab director demands that the technician mix X and Y, despite the technician's objection that the mixture will explode, the technician must not be beaten about the ears because of the result.*

Dear Mr. Campbell:

I'm writing in response to your suggestion that any reader with an idea for a better scoring system for the Analytical Lab send it along to you. That sort of thing is by way of being part of my business in advertising research—devising score tables for questionnaires and coding open-end questions and the like.

What I suggest is really only a relatively minor alteration in your present system—a scoring table of from one to ten for each individual story rather than a group ranking.

First—in defense of the possible objection that such a rating would be too much for your reader-respondents. They themselves would have to do the individual rating—scoring each story on the 1-10 scale. But, judging from the caliber of your audience and the high level of interest in the particular group, plus their evident willingness to write you in sufficient numbers to pro-



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vide you with enough responses to make up your present score—it seems unlikely that there would be any appreciable difficulty.

After getting off that last sentence, I'll get into the reasoning behind the 1-10 system. Although it is still a mathematical system which will not perfectly reflect the varying sentiments toward the stories, it will at least give the reader a wider latitude in assigning ratings. Rather than having to place one story either above or below another, it will allow him to assess each story individually, on whatever basis he may choose. He may give a rating of 7 to one story on the grounds of excellent characterization and plot, and a 7 to another on the basis of emotional appeal—and then feel that his rating duty has been discharged fairly. As you well know, as indicated by your note in *An Lab*, it would be highly cumbersome to try to construct a multiple scale of your own which would at the same time accurately show the different qualities of the stories and also place them in some reasonable rank. Thus the system must remain one of single numerical rating.

The objection might arise that such a rating system would throw stories to the mercy of either low-raters or high-raters, which would upset the results. Probably not so, considering the diversified character of your audience. Low-raters should cancel out high-raters.

Why not a five-number scale? Allows too little latitude in my opinion. Plus being too close to your old scale. It would tempt the reader to go right back to the 1, 2, 3, 4, 5 place ratings of old. A ten-unit scale gives them room to move around in—and it would be either a marvelously obstinate or a wondrously unperceptive person who would fall back on a 2, 4, 6, 8, 10 straight rating or its equivalent in odd numbers.

Why not a 100 scale? Too much room to move around in. It's been my experience in research that a ten-unit scale is about the optimum for responses. In composing scores, ratings or "grades," there is little difference in the untrained mind—untrained in that specific activity—between a rating of, say, 73 and 78.

Advantages the minor one that, with a 1-10 scale—with 10 being the highest score—you remove the lingering confusion of having a story with less points coming out in a higher place.

1. An interesting one that you have an all-time comparison figure which would be of interest both to you and to the reader. With the present system, as I have a feeling you may have mentioned once before, each story is ranked only against the others in that issue, penalizing some and helping others. Of course there will still be the tendency among some readers to score in the context of the issue before them—but the 1-10 scoring would damp

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that to an extent.

2. The main one that you have given the reader the opportunity for "parallel" scoring, for consideration of the merits of each story individually rather than a simple rank placement.

So—that's it. Let the readers know that's how you'd like the stories rated, even supply them with a coupon—bad in a way because of the unwillingness to mutilate the magazine—and I think they'll respond well. It would be interesting to see the results—especially, as mentioned in advantage #2, in that you could then publish quarterly or semiannually or annually a table showing the top five or so for that period. And perhaps even keep a running box of the top ten, regardless of how far back, with new stories pushing the older ones out—lot of reader interest in something of that sort, I believe.

Hope the suggestion is valuable to you.—Charles G. Leedham, 23 W.

90th Street, New York City 24, New York.

*Sounds worthwhile—but you readers would have to do it, so you decide whether you want the change. Leedham's arguments appeal to me.*

Dear John:

Thanks for the review of "Jack of Eagles." In fairness to prospective buyers among its readers, though, it might be a good idea to add that the novel did *not* appear "for the first time between boards, without having been serialized." A much shorter version of the story appeared in a magazine two years ago; Greenberg was supposed to have included a notice to that effect in the book version, but unaccountably forgot it until too late.

Effectively, however, the novel version is new. I rewrote the older story completely, and added 30,000 words of new material—plus a lot of research

that doesn't show in terms of word-count.—James Blish.

*It came out a new story, with that much change!*

---

Dear John:

Frederick Kingdom—ASF, Oct. '52—is entitled to his opinions despite his fears that this is no longer a free country. But his letter contains some misstatements so glaring as to call for refutation.

He argues that military secrecy is worthless because "we do not have, nor ever have had, any real atomic secrets." This is not so. Security was completely effective in World War II in keeping from the Germans two technical advances that they would very much like to have had: the atomic bomb and microwave radar. Ditto for the Japanese. That the Russians got some of the atomic bomb secrets by clever use of Communist sympathizers merely shows that security, like other human enterprises, may be successful or not, depending upon how vigorously and intelligently it is applied and upon how strong the opposition is. There is also a large element of luck. To argue from the success of the Russians in this case that we might as well throw all secret military experimental work open to the world is like saying that because guns don't always hit what they're aimed at we had better scrap them and go back to swords and crossbows.

Then Mr. Kingdom asserts that "military information"—inventions and developments—"has never been successfully developed by the military itself." Here, too, he is misinformed, belonging to that school of thought that holds that putting a man into uniform and compelling him to salute and say "sir" changes his basic personality into that of witless robot. The record shows otherwise: that the inventive spark flashes among military men as elsewhere. To take recent examples, the jeep was developed by an ordnance officer named Triplett, the guided missiles called the Bat and the Glomb by naval officers named Tucker and Barnaby, the modern warship combat intercommunication system by a naval officer named Laning, the turbojet aircraft engine by an RAF officer named Whittle, and so on. Farther back we have Colonel Thompson's submachine-gun, Colonel Swinton's tank, Admiral Dahlgren's cannon, General Count Zeppelin's rigid airship, Captain Paixhans' explosive shell, Major Davidson's motorized machine gun, Commander Maury's science of oceanography, et cetera, et cetera. I am not sneering at civilian engineers working on military projects, having been one of those myself too, but I am trying to explode the myth of the "bumbling militarists."

Who, by the way, do not "dictate our friends, our enemies, and our actions," not in this country anyway. Our friends and foes decide their classi-

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fication for themselves by their actions, which in turn depend upon their interests, their convictions, and their prejudices, over all of which, in the absence of a more effective international organization, "we" have only the most tenuous influence. It should not be necessary to cite ten pages of the hostile and aggressive actions of the USSR towards this nation since 1945, despite or because of the headlong unilateral post-war disarmament of the USA and the conciliatory and sympathetic attitude of the United States government towards the USSR during and immediately after World War II. If our military and political leaders guess wrong about the future attitude of the leaders of other nations towards us, well, men have been guessing wrong about each other's intentions since Man began and are likely to go on doing so. But that proves nothing about the relative intelligence of the "military" or the value of

military security.—L. Sprague de Camp.

*The primary handicap of the military man in applying creative thought—i.e., making an invention—is not the fact that he is in military service, but that he is in an inherently totalitarian organization. Any military force, like any bureaucracy, operates on policy—on relatively rigid postulates of how-to-act. The civil servant is just as handicapped as the military officer. The Russian scientist, although a civilian, is handicapped because his work must conform to State policy. The United States is better than most military forces in that respect; you can never quite convince an American citizen that he isn't an individual first, and a statistic in military organizational records second.*

Dear Mr. Campbell:

Your recent editorial on speculation

was both interesting and provocative. The complexity/efficacy curve for technological devices caused me some speculation.

What is a "technological device"? You cite as examples the radio, the automobile, and the airplane. Let's consider radio, to start with. Is a grid-leak detector set the same type of technological device as the modern diode detector super-het? Didn't the earlier type of radio receiver—grid-leak, et cetera—develop to a high stage of theory and complexity to be replaced by a new device—the super-het—of a different theory and complexity? If this is the case your curve never reaches the base line because one device is replaced almost completely by another somewhere along the curve. Another example of this process is provided by the change-over from reciprocating to reaction motors in aircraft. The resultant curve for radio, say, becomes something like the profile of a cobblestone road going uphill.

Let's look at it another way. Let's consider the broader aspects of the term chronological device. Review, for example, the development of calculating devices. Great Grandpa used fingers, Grandpa—an abacus, Dad—log tables, me—a slide rule, Junior—an electric calculator, and Junior Junior will use the latest MANIAC. Complexity, apparently, is still increasing.

When this curve reaches the base line will we have people who can calculate mentally without any recourse to mechanical aids? Or is this too much to expect? And if we ever did return to mental arithmetic would this be considered as part of the development of the technological device, "calculator"?

While we're on the subject, S. F. deals frequently with the man machine conflict. Either the machines revolt—very bloody—or people stop using them and impose a penalty on anyone who does. How does the machine that is going to revolt, or the person who is not going to use it, decide who or what is a machine? Is a stick that was once used as a lever a machine, or is this giving it preferential treatment over non-lever sticks? Is a calculator a machine? Is a slide rule a machine? Now then, is a set of log tables a machine? If not, why not? Or, going back to your graph again, does a "machine" become a "process" or vice versa at some stage in its development?

One more question and then I'm through. Can this whole problem be laid in the lap of our newest cure-all and aid to mental health, Semantics? —D. F. Pooley, 47 Lakeview Avenue, Toronto, Ontario, Canada.

*Let's say a machine is something non-living that serves a purpose.*



Sgt. 1st Class  
Einar H. Ingman  
U. S. Army  
Medal of Honor



"The sergeant charged alone . . ."

THE REDS IN AMBUSH on the ridge had lain concealed, withholding their fire. Now they opened up. The two squads were trapped, their leaders wounded.

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